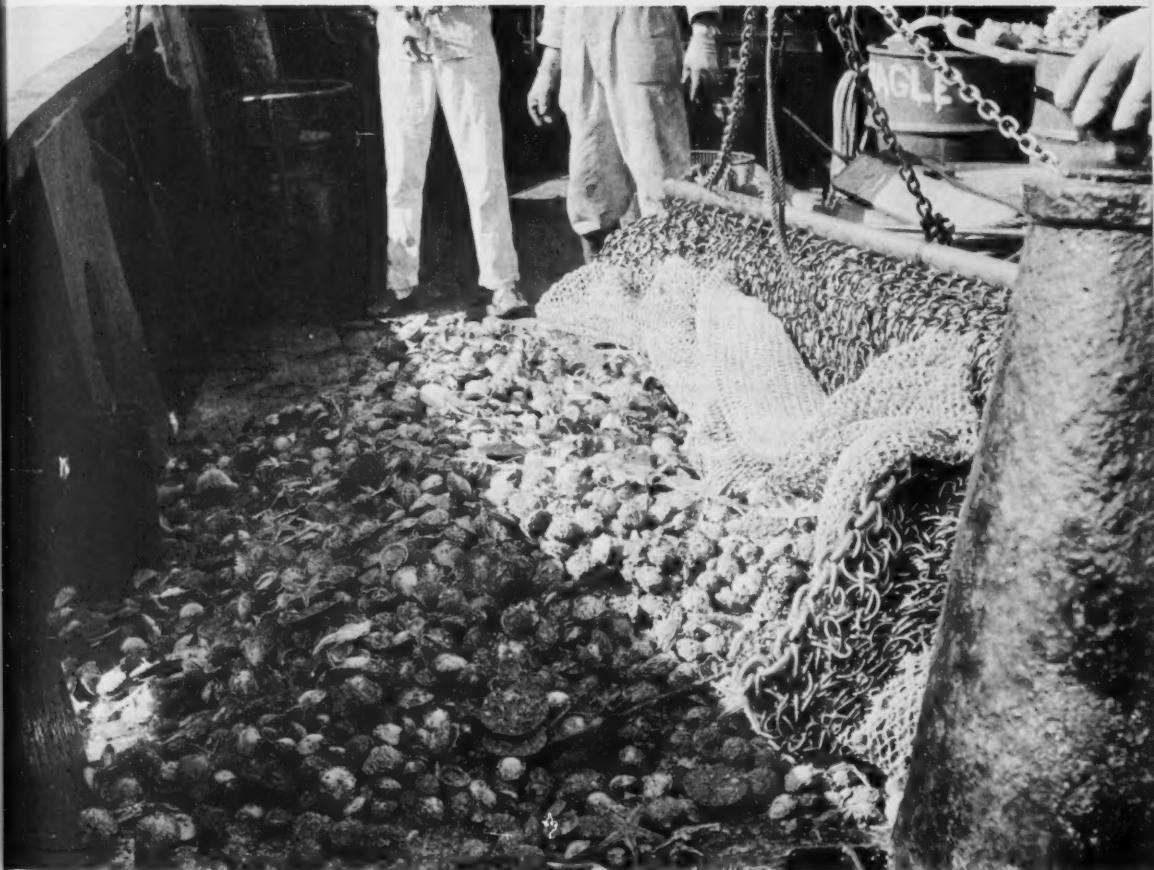


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# COMMERCIAL FISHERIES REVIEW



Vol. 22, No. 7

JULY 1960

FISH and WILDLIFE SERVICE  
United States Department of the Interior  
Washington, D.C.



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# COMMERCIAL FISHERIES REVIEW



A review of developments and news of the fishery industries prepared in the BUREAU OF COMMERCIAL FISHERIES.

Joseph Pileggi, Editor  
H. M. Bearse, Assistant Editor

Mailed free to members of the fishery and allied industries. Address correspondence and requests to the: Chief, Branch of Market News, Bureau of Commercial Fisheries, U. S. Department of the Interior, Washington 25, D. C.

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# COMMERCIAL FISHERIES REVIEW

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## PROXIMATE COMPOSITION OF SOUTHERN OYSTERS-- FACTORS AFFECTING VARIABILITY

Charles F. Lee,\* Caroline H. Kurtzman,\*\* and Leonard Pepper\*\*\*

### ABSTRACT

Fifty-one pairs of samples of raw shucked oysters were collected from producing plants in Georgia, South Carolina, and the Gulf Coast States in an extension of an earlier study of the proximate composition of oysters. From each plant, unwashed "shell" oysters and washed plant oysters as packed were obtained to compare the effect on composition of differences in plant practices. The dry solids, fat, and carbohydrate contents of all samples conformed to the usual seasonal pattern of variability. Low values observed in summer and fall months increased to a maximum in the late spring just prior to the long spawning period of the Southern oyster.

The ash and salt content of the "shell-oyster" samples are primarily factors of the salinity of the water in which the oysters are grown. In the test period, salinities were high during the late summer. Soluble chlorides, mostly salt, are lost during shucking and washing of the oysters so that the ash and salt content of plant-washed samples are influenced by the amount of exposure to fresh water.

Protein and fat content on a dry basis are increased in the washed oysters, since these components are less soluble and thus constitute a larger proportion of the solids remaining after the soluble salts are lost.

The data on composition emphasize the benefit that would be derived for both producer and consumer if the seasonal demand for oysters in the fall could be met with oysters harvested and frozen in the spring.

### INTRODUCTION

The investigation of the proximate composition of Southern oysters conducted at the Fishery Technological Laboratory, College Park, Md., of the U. S. Bureau of Commercial Fisheries, was continued for a second year. The conclusions reached after the first year (Lee and Pepper 1956) regarding the pattern and extent of seasonal fluctuation have been generally confirmed, so this work is now complete.

The term "Southern" is used here to distinguish the product of the Gulf of Mexico and of the South Atlantic coastal areas. Louisiana has the largest production of fresh shucked oysters, with lesser quantities from Mississippi, Alabama, Western-Florida, South Carolina, and Georgia. Southern oysters, Crassostrea virginica, are of the same species as oysters of Chesapeake and Delaware Bays, but the shucked product is handled differently in the South.

The investigation of the composition of Southern oysters had several objectives: (1) Little published information is available on the composition of oysters from that area. Such information is needed by dietitians, processors, and others. (2) The data on unwashed and plant-washed samples provide a means of comparing the effect on composition of different methods of processing. These data are important with re-

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spect to application of the Food and Drug Administration's Standards of Identity to raw shucked oysters. (3) Data on oysters from a number of different states and growing areas are needed to broaden the applicability of results of studies on freezing and utilization of oysters by research groups in Florida and Louisiana.

#### ORIGIN OF SAMPLES

The oyster samples were collected at producing plants: 25 sample pairs were obtained from Louisiana, 9 from Alabama, 7 from Florida, 5 from South Carolina, 3 from Georgia, and 2 from Mississippi. Samples of mixed origin were not taken, so each sample represented oysters grown in the state in which it was collected.



Fig. 1 - Oysters are brought to the shucking house in burlap bags in some Southern oyster plants.

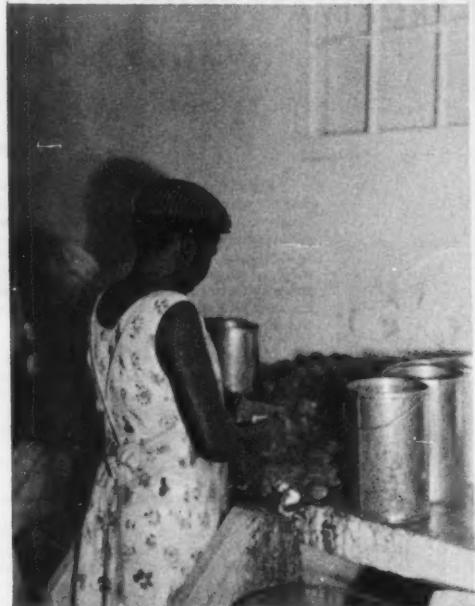


Fig. 2 - Three sizes are being sorted into the "pots" at the right.

Two samples were collected from each operating plant visited. One sample, called the "shell" sample, consisted of unwashed shucked oysters representative of the oyster as harvested. Variability in composition of these samples is influenced by environmental factors of temperature and salinity, sampling time with relation to spawning cycle, and other factors such as degree of parasitic infestation that affect the health or "condition" of the oyster. The composition of the shell sample is also affected by the way the shell oyster is handled between the time of harvest and sampling and by the way the sample is taken.

The second sample, called the plant sample, was a randomly-selected pint can of the regular plant product. Variability in the composition of these samples is affected not only by differences in the "shell" oyster but also by shucking, washing, and draining practices of the particular plant from which the sample is obtained.

#### EXPERIMENTAL METHODS AND RESULTS

A total of 51 "shell" and plant samples were obtained during the period from October 1955 to October 1956, inclusive. These were analyzed for moisture, crude

protein, crude fat, ash, and total chlorides as sodium chloride. The values reported for carbohydrates have been calculated by difference. Because the maximum observed dry-matter content was  $2\frac{1}{2}$  times the minimum value (range 7.3 to 18.4 percent), the data are reported in the tables on a dry basis. This method of reporting facilitates comparisons of the effects of external factors on the composition of the oyster. The data are given in tables 1 and 2.

Table 1 - Composition of Shell and Plant Samples of Oysters According to State Origin

State	Number of Pairs <sup>1</sup> /	On Moisture-Free Basis											
		Moisture		Protein		Fat		Ash		Salt <sup>2</sup> /		Carbohydrates	
		Shell	Plant	Shell	Plant	Shell	Plant	Shell	Plant	Shell	Plant	Shell	Plant
(Percent) . . . . .													
Louisiana													
Mean	25	87.8	88.8	52.0	54.0	10.8	11.2	12.4	8.5	6.4	3.4	25.0	26.3
Maximum		91.4	92.7	63.3	66.2	16.7	17.6	20.6	17.1	12.6	7.2	34.8	36.3
Minimum		81.6	82.1	44.5	43.1	6.9	6.4	5.3	4.2	1.2	0.4	8.1	15.6
Mississippi													
Mean	2	87.5	86.8	48.7	50.7	13.0	14.1	11.8	7.7	5.6	2.2	26.5	27.5
Maximum		92.5	89.1	58.7	60.8	18.1	19.5	17.7	11.1	10.1	3.8	37.5	35.6
Minimum		82.5	84.3	38.6	40.7	8.0	8.8	5.8	4.3	1.0	0.6	15.6	19.3
Alabama													
Mean	9	86.2	86.1	44.3	45.0	11.8	13.9	10.3	7.1	5.6	2.7	33.6	33.9
Maximum		88.5	90.0	55.5	55.9	14.0	18.7	14.1	12.1	9.9	6.2	45.8	40.3
Minimum		84.4	82.5	35.4	39.6	7.4	9.4	5.7	3.6	1.3	0.4	21.4	23.6
Florida													
Mean	7	88.3	87.3	48.3	53.2	9.4	12.1	17.8	10.7	10.0	5.0	24.5	24.0
Maximum		91.1	88.7	52.6	56.8	11.2	16.5	26.7	16.9	19.8	9.9	35.7	33.1
Minimum		86.0	85.5	45.7	48.1	6.7	8.3	8.0	5.8	2.9	2.2	18.4	19.0
Georgia													
Mean	3	90.0	85.8	43.8	50.7	10.2	9.9	24.8	13.2	19.6	6.6	21.2	26.3
Maximum		92.0	89.7	47.1	57.3	15.2	10.8	31.1	16.4	25.4	10.0	26.3	32.6
Minimum		87.4	82.2	40.6	45.4	7.5	8.8	22.7	7.3	15.6	2.7	13.9	16.9
South Carolina													
Mean	5	86.1	84.2	47.7	54.1	7.7	9.3	20.8	11.9	14.4	6.7	23.8	24.7
Maximum		88.8	85.8	49.8	55.9	9.1	10.2	24.6	15.3	19.8	10.0	31.0	27.1
Minimum		83.0	83.0	45.8	52.1	5.6	8.7	17.4	8.9	10.5	4.8	19.7	22.1

<sup>1</sup>Each pair of samples consists of unwashed oysters ("shell") and washed oysters as packed (plant).

<sup>2</sup>Total chlorides are reported as salt.

**PREPARATION OF THE SAMPLE FOR ANALYSIS:** The entire contents of the sample can, from 250 to 450 grams of oysters and body fluids, were ground in a laboratory blender. Any large pieces of shell were removed, but careful inspection was not needed, since most of the shell and grit settled out of the ground oysters.

**MOISTURE:** The method of the Association of Official Agricultural Chemists (AOAC) for total solids in raw oysters was used (8th edition, section 18.6) except that a Petri dish was substituted for the metal one. Metal dishes were found hard to clean. Glass dishes gave consistent tare weights.

Comparison of the average values for moisture content in tables 1 and 2 indicates that, in most instances, there is little difference between the values for plant and "shell" samples. The data in table 2 indicate an irregular correlation of moisture content of both plant and "shell" oysters to season of harvesting. Lower moisture values and correspondingly higher solids



Fig. 3 - Care is used to avoid cutting up the oysters as the muscle is freed from the shell.

contents were observed from March through June just prior to the spawning season, this being the period of most rapid growth. The dry solids content declined rapidly to a low point in August and did not show definite recovery until December after cooler waters had stopped oyster spawning and growth was resumed.

Table 2 - Composition of Shell and Plant Samples of Oysters According to Month Samples Were Collected

Month	Number of Pairs <sup>1/</sup>	On Moisture-Free Basis											
		Moisture		Protein		Fat		Ash		Salt <sup>2/</sup>		Carbohydrates	
		Shell	Plant	Shell	Plant	Shell	Plant	Shell	Plant	Shell	Plant	Shell	Plant
Oct. 1955	5	90.5	88.5	54.5	58.1	9.0	9.1	19.8	13.4	13.5	6.2	16.8	19.5
		92.5	92.7	60.2	66.2	16.7	10.3	26.7	17.1	19.8	9.9	21.3	23.9
		88.7	83.8	48.1	51.1	5.8	8.3	14.9	8.0	8.7	3.8	8.1	15.6
Nov. 1955	5	87.9	85.5	52.5	56.5	9.0	9.2	16.6	11.9	9.4	5.8	22.0	22.3
		89.8	92.3	58.4	60.5	11.2	11.2	24.3	16.9	14.1	9.9	29.0	24.5
		86.1	86.4	47.2	53.8	6.9	8.3	11.0	9.4	5.5	4.1	16.3	19.9
Dec. 1955	3	86.3	86.1	50.3	55.5	7.9	9.4	16.1	10.6	10.1	5.7	25.7	24.4
		89.8	91.7	54.9	61.5	8.7	9.6	19.6	12.1	10.5	6.2	31.1	29.2
		84.4	82.5	46.1	49.2	6.9	9.2	14.1	9.7	9.8	5.2	22.4	18.9
Jan. 1956	6	87.7	86.8	48.1	47.5	9.7	12.8	15.4	7.7	8.6	3.8	26.8	32.0
		91.3	91.5	50.4	54.8	12.7	17.9	21.3	9.2	12.6	5.5	31.8	36.9
		83.8	83.5	41.5	39.6	7.2	9.2	8.6	5.6	4.7	1.5	20.8	27.1
Feb. 1956	7	88.1	87.1	43.1	46.5	11.7	12.9	14.0	8.3	9.4	3.3	31.2	32.3
		92.0	89.9	46.1	52.2	16.8	18.7	22.7	16.4	17.8	7.0	35.7	35.7
		85.3	82.2	35.4	40.0	5.6	8.8	5.3	4.2	1.2	0.7	23.5	26.8
Mar. 1956	6	84.8	85.6	44.0	46.0	13.5	15.8	8.1	6.1	2.9	1.6	34.4	32.2
		87.7	88.9	51.4	54.6	18.1	19.5	11.9	10.5	5.4	3.6	45.8	40.3
		81.6	82.1	38.6	40.7	7.4	12.4	5.7	3.6	1.0	0.4	22.7	21.6
April 1956	5	86.5	85.6	46.6	48.3	12.5	14.8	11.7	6.9	6.1	2.3	29.2	29.9
		91.1	87.9	52.6	56.8	13.3	16.5	16.4	9.1	10.5	2.8	37.3	40.0
		82.5	83.7	42.2	39.8	10.8	13.1	6.4	4.7	1.9	1.0	20.5	22.3
May 1956	2	84.9	86.5	49.6	51.2	12.1	12.3	7.9	5.8	3.9	2.0	30.5	30.7
		86.5	89.9	52.0	52.5	13.5	13.5	8.1	5.9	3.9	2.2	34.5	30.7
		83.2	83.0	47.1	50.0	10.9	11.0	7.6	5.8	3.8	1.8	26.4	30.6
June 1956	2	83.8	86.1	47.5	50.2	10.3	12.0	11.7	6.6	6.2	3.0	30.6	31.2
		85.0	89.7	48.3	53.1	10.3	12.3	12.8	7.0	6.7	3.6	32.6	33.5
		82.7	82.5	46.6	47.3	10.2	11.7	10.6	6.2	5.6	2.4	28.6	29.0
July 1956	2	87.9	90.1	59.5	61.1	8.8	7.5	10.4	8.0	4.5	2.9	21.3	23.4
		88.6	91.5	63.3	61.8	9.8	8.6	10.9	9.3	4.8	3.6	24.5	25.1
		87.1	88.7	55.8	60.4	7.8	6.4	9.9	6.7	4.2	2.3	1.1	21.7
Aug. 1956	2	90.0	90.4	56.6	58.7	9.9	9.5	10.4	8.7	3.1	2.7	23.1	23.1
		90.6	91.2	57.3	59.4	10.8	10.7	11.9	9.9	5.0	4.2	26.2	23.8
		89.4	89.5	55.9	58.0	9.0	8.3	9.0	7.5	1.2	1.1	20.0	22.4
Sept. 1956	2	88.4	88.6	53.8	58.3	9.6	8.6	14.5	9.6	10.6	5.0	22.0	23.5
		88.6	90.2	54.8	58.9	11.6	9.5	18.3	9.8	11.2	5.8	26.8	24.0
		88.2	86.9	52.8	57.8	7.6	7.7	10.8	9.4	9.9	4.3	17.3	23.0
Oct. 1956	4	89.5	87.7	49.2	54.6	9.7	10.3	23.1	13.6	14.2	6.9	19.0	21.5
		90.7	91.9	53.0	57.3	10.8	10.9	31.1	15.9	25.4	10.0	25.7	25.9
		88.0	84.3	45.8	52.1	7.9	10.0	17.2	8.4	1.3	0.4	13.9	16.9

<sup>1/</sup>Each pair of samples consists of unwashed oysters ("shell") and washed oysters as packed (plant).

<sup>2/</sup>Total chlorides are reported as salt.

**CRUDE PROTEIN:** Total nitrogen was determined by the Kjeldahl method, mercury being used as the catalyst. The ammonia was collected in 20 milliliters of 4-percent boric acid and was titrated directly with 0.2 normal sulfuric acid.

Shucking and washing the oysters do not significantly affect protein content on a dry basis. Plant samples are higher in protein, but this finding can be accounted for by the fact that as the soluble salts present in the body fluids are lost during shucking and washing, the more insoluble constituents--that is, protein and fat--make up a greater proportion of the remaining solids. The protein content of oysters follows a fairly definite seasonal cycle opposite in phase from the glycogen content cycle; that is, protein content is high during July through September, when glycogen is low, and low in February and March, when glycogen is high. The explanation is that protein constitutes a much larger proportion of the solids remaining after glycogen is used during the spawning cycle.

**CRUDE FAT:** The method of the AOAC for crude fat in fish and shellfish by acid hydrolysis (8th edition, section 18.12) was used.

"Fat" oysters is a trade expression that refers to the plump, creamy condition associated with the seasonal build-up of glycogen. Oysters are usually classified as a nonfat seafood. Actually, on a dry basis, the solvent-soluble lipids constitute an average of 10.5 percent of "shell" oysters and 11.7 percent of the washed oysters. Some oysters contain 18 to 20 percent fat on a dry basis. Experiments have shown that in frozen storage, oysters develop a rancid flavor instead of the usual sour flavor that develops in spoiled raw iced oysters (Schwartz and Watts 1957; Fieger, Novak, and Bailey 1959). It is interesting to note that the fat content follows the same type of seasonal cycle as do dry solids and glycogen contents; that is, the fat content varies from a high of 13 percent in March and April to a low of 8.8 percent in July. The fluctuations are less extreme--with the fat content remaining fairly constant, between 9 and 10 percent--from August through December.

ASH: Fifteen to 20 grams of ground oysters was weighed into a tared porcelain dish and ashed at 550° C. until white. (Ash occasionally may be pale blue, or may fuse and remain black, but extra heating should be avoided as it may cause loss of chlorides.)

Chlorides and other soluble salts make up most of the ash of unwashed oysters which may amount to 25 percent of the dry weight for oysters grown in waters of high salinity. The ash content of the washed plant samples is decreased to a degree dependent on the amount of washing with fresh water, and approaches a minimum of roughly 4 percent of the dry weight.

TOTAL CHLORIDES: The method of the AOAC for salt (chlorine as sodium chloride, 8th edition, section 18.9) was used.

The soluble salts in oysters are readily removed during the usual washing operations. Thus a comparison of the total chlorides of the washed and unwashed samples gives an indication of the amount of exposure to fresh water to which the oysters were subjected. The salt content of "shell" oysters varies greatly, depending on the salinity of the waters where the oysters grew. Since Crassostrea virginica is an estuarine species, salinity of water over oyster beds is largely a matter of rainfall on the river system draining into the growing area and may range from extremes in excess of 40 parts per thousand in almost closed bays in Texas or North Carolina to less than 4 parts per thousand in some growing areas in Louisiana or in the upper Chesapeake Bay during flood periods. In fact, fresh water has frequently caused heavy mortality in some oyster-growing areas. In the accompanying data, the extreme range for the salt content on the dry basis of individual samples of shell oysters was 1.0 to 25.4 percent.

The salt content of the washed oysters (the plant sample) is only secondarily influenced by the original salt content. Even unwashed oysters lose one-half or more of their salt content in body fluids released during the time on the shucking bench. Then, the usually limited exposure to fresh water during the washing operations used in South-



Fig. 4 - In the South, oysters usually receive a brief washing in a pan before packing. Blowers are never used.

ern plants further reduces the salt content of the plant samples, though never to the degree of freshness reached by "blowing" as practiced in the Middle Atlantic States.

In typical estuarine growing areas, seasonal wet and dry spells change water salinities to produce a seasonal pattern of fluctuation in the salt and ash content of the oysters. In the 1955/56 season, as in the preceding year, lack of rainfall during fall and winter months kept oyster salinities high, whereas heavy precipitation during the spring and summer reduced salinities. In September and October 1956, oyster salinities again increased.

**CARBOHYDRATES:** In these studies glycogen was not determined directly. The difference between 100 and the sum of moisture, protein, fat, and ash has been reported as carbohydrates (by difference). This would include glycogen, its breakdown products, and the accumulative error from the other analyses. Although much less specific, the results obtained by this procedure have shown good correlation to the variation in glycogen that would be expected to result from the spawning and growth patterns of Southern oysters.

The average carbohydrate content of the plant samples is only slightly greater than that of the shell samples. Carbohydrate content evidently does not show the same proportional increase that was observed for the protein and fat content of the plant samples, which resulted from the loss in salt. This observation might indicate that significant amounts of soluble glycogens also are lost in the body fluids. The data for carbohydrates follow the well-known seasonal pattern related to spawning habits. Glycogen is stored during the late fall and early winter and holds over, with little loss, until May or June. Spawning continues during the hot summer period, so there is little recovery of "fatness"--that is, glycogen content--until the cool weather of late fall.

#### DISCUSSION

The weighted average of 12.6 percent dry solids content for the plant-washed samples of Southern oysters compares favorably with the solids content of oysters from Chesapeake Bay. Unpublished data from the Food and Drug Administration, the senior author, and recent studies of a government-industry research team are in general agreement in the values found for dry solids content of oysters in Chesapeake Bay. Although some washed samples from Chesapeake Bay have a high dry solids content--more than 14.0 percent--this is exceptional. In the early fall, sam-

ples with dry solids ranging from about 12.0 to less than 9.0 percent are observed for both the unwashed and plant-washed oysters.

The relatively high solids content of Southern oysters is a result of the more limited exposure to fresh water during the washing methods customarily used in the South; that is, spraying the oysters on the delivery skimmer. This treatment is sometimes followed by stirring the oysters gently in a pan or bucket of fresh water. In preparation of samples for analysis the liquor that bled out of the meats after packing was included. Thus values for dry solids content of drained oysters would have



Fig. 5 - Some Southern oyster plants use only a spray wash on the receiving skimmer, thus preserving the natural salty flavor.

been higher. It is a characteristic of Southern oysters, and occasionally of oysters from certain beds in the Chesapeake Bay area, to form excessive amounts of free liquor within a short time after packing, even when exposure to water has been quite limited. This has greatly complicated enforcement of Section 36.10 of the present U. S. Food and Drug Administration Standards of Identity for raw oysters which defines this product, in part, by its free liquor content.

In January 1959, studies were started by the Government-Industry-Cooperative Oyster Research Program team of the physical and chemical characteristics and changes occurring during processing of oysters in the Chesapeake Bay and other nearby oyster-growing areas. This research has the primary objective of obtaining information useful in revision of current Standards of Identity. The data on composition of Southern oysters obtained in the studies herein reported confirms the necessity for extending the Government-Industry-Cooperative Oyster Research Program investigations to include oysters from the Gulf Coast at the earliest opportunity.

Although the number of samples from most of the Southern States was not sufficient to give a complete pattern of season variation, the data indicate that this pattern is similar in all areas. Unfortunately, the product is at its best when the demand for it is lowest--that is, in the late spring months. The industry would therefore have an advantage if it could operate in such a manner that no oysters would be shucked during September, October, and November. At this time, Southern oysters are still thin, the yield is poor, prices for oysters in the shell are high, and plants often operate at a loss, but the market demands oysters and the plants operate to supply this market. The data illustrate the magnitude of these differences and the need for developing methods, such as freezing, of holding raw shucked oysters from the spring when they are in optimum condition, until the fall increase in market demand. At present, oyster canneries use these spring oysters, but this processed product cannot compete for the same market as the fresh or frozen raw shucked oysters.

#### CONCLUSIONS

1. The total solids, carbohydrate, and fat contents of the oyster show a seasonal pattern of fluctuation, from high values in the late spring just prior to spawning to low values during the fall just before cooler waters stimulate new growth.
2. The salt and ash contents are related primarily to water salinity, which is influenced by rainfall and other environmental factors that vary for each oyster bed. In the 2 years from October 1954 to October 1956, oysters taken in the fall had higher salinity than those taken in the spring or the summer.
3. As a result of loss of salt during shucking and washing, insoluble constituents of the plant samples--that is, protein and fat--constitute a higher proportion of the remaining solids. The carbohydrate content of washed plant samples increases less than the proportional amount of solubles solids lost, indicating some loss of soluble glycogens during washing. The proportion of the original salt content that remains in the washed oysters depends on the amount of exposure to fresh water during the washing process.
4. Solids content of Southern oysters varies over a wide range, but the average of 12.6 percent for all washed oysters is comparable with that of oysters from Chesapeake Bay.
5. Oysters from all Southern States have a similar pattern of seasonal variability. Benefit to the industry would result through increased production and utilization of oysters during March through May, perhaps by use of freezing if the technical problems were solved.

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## LONG SALMON MIGRATIONS

As a part of the International North Pacific Fisheries Commission program, the Fisheries Research Institute has been tagging salmon in the North Pacific Ocean under a contract from the U. S. Bureau of Commercial Fisheries. The objective of the tagging study is to determine the qualitative and quantitative distribution of salmon at sea with respect to continent of origin.

Some amazingly long migrations of salmon and steelhead trout have been recorded from this work. One of the most interesting cases concerns a steelhead which was tagged on September 5, 1958, in the Gulf of Alaska, near Kodiak Island, and recovered February 5, 1960, at a fish cultural station on the Alsea River, Oregon. Personnel at the station state that the fish had been fin-clipped and released in the Alsea River in April 1958. At that time it was approximately 5 or 6 inches in length. At tagging it measured 14 inches and at recovery, 22 inches. Fin clips were not noticed during tagging since time is not taken to watch for missing fins. However, at final recovery, fin clips were still unmistakable. Thus, data on this steelhead (positively identified at three points) revealed its origin, a minimum migration of 2,400 miles round trip, and true homing at maturity.

The longest migrations have been reported from steelhead trout and king salmon. Some of these fish have really traveled. For example, a steelhead tagged south of Adak on July 19, 1957, was recaptured by rod and reel in the Chehalis River, Washington State, on March 13, 1958. The distance traveled was approximately 2,000 miles in 8 months. A king salmon tagged in approximately the same area in 1956 was recovered in the Salmon River, Idaho, the following year. The fish was at liberty 11 months and traveled a minimum of 2,400 miles.

## PROCESSING AND QUALITY STUDIES OF SHRIMP HELD IN REFRIGERATED SEA WATER AND ICE

### Part 4 - Interchange of the Components in the Shrimp-Refrigerated-Sea-Water System

By Jeff Collins\*

#### ABSTRACT

Whole raw pink shrimp were held for various periods of time in refrigerated sea water. Data were obtained to determine the effect of holding time on the weights of the whole shrimp and of the sea water and on the weights of peeled meats, of peeling waste, and of precooked meats subsequently prepared from the whole shrimp. In addition, water, salt, ash, and solids content of the above products were determined in order that factors affecting the changes in weight could be better understood.

#### BACKGROUND

In a previous paper (Seagran, Collins, and Iverson 1960) in which the keeping quality of pink shrimp held in ice and refrigerated sea water was studied, it was found that there was an apparent loss in solids of the peeled meats as a function of holding conditions. It was not known, however, to what degree this loss was caused by leaching of the soluble constituents or by water uptake.

The primary purpose of the present study was to resolve this uncertainty and secondly, to more fully characterize the various changes which occur in the shrimp-brine system. Accordingly, a study was made of the material balance of water, solids, ash, and salt contained in the various components of the system; namely, the brine, whole shrimp, peeling waste, and meats obtained from the whole shrimp, and the precooked meats subsequently obtained from the peeled meats.

The holding system, of course, consists of whole shrimp and 3-percent brine. In the subsequent discussion it is convenient, however, to think of the system as consisting of brine, whole shrimp, peeling waste, peeled meats, and precooked meats. Each of these components of the system will change in its water, solids, ash and salt content as a function of holding time.

#### EXPERIMENTAL

The general experimental approach was (1) to hold pink shrimp for a period of time in refrigerated sea water, (2) to determine any changes in weight of the whole

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Fig. 1 - Chemist preparing to precook raw peeled shrimp in the laboratory steam box.

shrimp, its components, or the brine, and (3) to determine the moisture, ash, salt, and solids contents of the components of the shrimp-brine system as a function of holding time.

**MATERIAL:** About 30 pounds of whole fresh pink shrimp (*Pandalus* species) were obtained from Petersburg, Alaska. The shrimp, which were about 3 hours old when landed at the plant, were iced overnight and shipped by air to the Ketchikan Technology Laboratory. The shrimp were briefly rinsed in cold fresh water and allowed to drain for about 15 minutes in a wire basket.

**HOLDING METHOD:** Each of 24 glass jars was essentially filled with 450 grams of raw whole pink shrimp and 450 grams of a 3-percent aqueous solution of sodium chloride. The jars were sealed with rubber-gasketed glass lids and held up to 11 days in a pilot-scale refrigerated-sea-water unit at 30° F. (Collins 1960). (The use of a "closed" system was discussed in a previous paper, Collins, Seagran, and Iverson 1960.)

**SAMPLING TECHNIQUE:** Since the taking of a sample would change the weight of the system, the sampling had to be devised in such a way that this change in weight could be taken into account. The technique was as follows:

1. Three jars were removed from the tank, the contents combined, and the shrimp drained on a wire screen for 5 minutes.
2. The weights of the whole shrimp and brine were obtained separately and samples of both were taken for subsequent analysis. After reweighing, the whole shrimp were carefully hand-peeled so that all meats were separated from the waste.
3. The peeled meats and waste were weighed and a sample of the meats saved. Since the waste was very heterogeneous, the entire waste was blended for 5 minutes in a Hobart Chopper and a sample of the homogenate saved.
4. The reweighted meats were precooked<sup>1/</sup> for exactly 2 minutes under a slight positive pressure, cooled on a cloth towel for 5 minutes, reweighed, and save for subsequent analysis.
5. All samples were placed in sealed glass jars and held at -20° F. until analyzed.

**ANALYTICAL METHODS:** The analyses for moisture, total chloride, and ash were carried out as previously described (Collins, Seagran, and Iverson 1960).

## RESULTS AND DISCUSSION

The weights of the components of the system and the water, ash, salt, and solids contents of each component are given for each period of holding in tables 1 to 5. In addition, the water, salt, and solids data are illustrated graphically in figures 2 to 4. These weight data have been adjusted so that each value is independent of prior sample removal. The values given for ash are termed "corrected ash" and are obtained by subtracting the salt from the total ash. The solids values do not include ash or salt. The solids, therefore, consist essentially of the nitrogenous components of the shrimp along with a small amount of oil and other minor constituents.

Changes in the various components--whole shrimp, sea water, raw peeled meat, peeling waste, and precooked meat--were as follows:

<sup>1/</sup>The pre-cook was carried out in a galvanized sheet metal box containing a stainless steel screen on which the peeled meats were spread. Steam at 40 psig was introduced through a copper tube, perforated so as to fill the chamber without subjecting the sample directly to the jets (fig. 1).

**WHOLE SHRIMP:** The whole shrimp gained weight rapidly when placed in the refrigerated sea water (table 1). This gain in weight was due to the absorption of water and sodium chloride. Accompanying this increase in weight, however, was a decrease in the amount of corrected ash and in the amount of solids. The loss in

Table 1 - Whole Shrimps: Change in Weight of Whole Shrimp and Their Component Parts With Time of Holding in Refrigerated Sea Water

Holding Time	Total Weight of Whole Shrimp After Various Holding Times	Total Weight of the Components of Whole Shrimp after Holding 1350 g. Whole Shrimp in 1350 g. 3-Percent Brine for Various Times at 30° F.			
		Water	Chloride	Corrected Ash (Ash-NaCl)	Solids <sup>1</sup>
Days	Grams	Grams	As g. NaCl	Grams	Grams
0	1350	1018	7.2	41.4	283
1	1412	1113	19.8	36.9	243
2	1469	1180	21.0	36.7	231
3	1438	1150	22.0	37.5	228
4	1483	1180	22.4	41.7	239
7	1484	1193	22.7	40.8	227
8	1462	1176	22.5	38.5	225
9	1437	1162	22.5	37.9	215
11	1430	1157	22.7	36.6	214

<sup>1</sup>/Solids: The total weight of solids, other than ash and NaCl (salt). This solids value is essentially the nitrogenous components plus certain minor constituents. The solids value is obtained by subtracting the water, NaCl, and ash from the total weight of the component for each holding period.

solids was relatively large. By the end of the holding period, about one-fourth of the original weight of solids had been lost, even though the total weight of the whole shrimp was 6-percent higher than the original starting weight.

**SEA WATER:** Reflecting the over-all increase in the weight of the whole shrimp, the refrigerated sea water lost weight (table 2). This loss in weight was due to the water and sodium chloride that the shrimp had absorbed. Inasmuch as the whole shrimp lost corrected ash and solids, the sea water correctly showed an increase in

Table 2 - Brine: Change in Weight of Brine and Its Component Parts With Time of Holding in Refrigerated Sea Water

Holding Time	Total Weight of Brine After Various Holding Times	Total Weight of the Components of the Brine after Holding 1350 g. Whole Shrimp in 1350 g. 3-Percent Brine for Various Times at 30° F.			
		Water	Chloride	Corrected Ash (Ash-NaCl)	Solids <sup>1</sup>
Days	Grams	Grams	As g. NaCl	Grams	Grams
0	1350	1309	40.2	-0.27	1
1	1270	1215	27.5	2.67	26
2	1227	1165	25.1	3.07	34
3	1258	1191	25.3	3.90	38
4	1207	1138	24.0	3.62	42
7	1213	1137	23.6	4.37	48
8	1228	1148	23.8	4.91	52
9	1225	1166	24.0	5.75	55
11	1250	1166	22.7	6.25	56

<sup>1</sup>/See footnote table 1.

these two constituents. The relations between the weights of water, sodium chloride, and solids and the holding time for both the whole shrimp and the refrigerated sea water are shown graphically in figures 2, 3, and 4.

Table 3 - Peeled Meats: Change in Weight of Peeled Meats and Their Component Parts With Time of Holding in Refrigerated Sea Water

Holding Time	Total Weight of Peeled Meats After Various Holding Times	Total Weight of the Components of the Peeled Meats After Holding 1350 g. Whole Shrimp in 1350 g. 3-Percent Brine for Various Times at 30° F.			
		Water	Chloride	Corrected Ash (Ash-NaCl)	Solids <sup>1</sup>
Days	Grams	Grams	As g. NaCl	Grams	Grams
0	470	377	2.5	5.4	85
1	526	432	7.1	4.7	82
2	558	464	8.6	4.8	81
3	556	465	9.3	4.4	77
4	550	460	8.9	4.6	76
7	550	466	9.3	4.5	72
8	543	459	9.0	4.1	71
9	529	447	8.7	4.2	69
11	514	434	8.7	4.1	67

<sup>1</sup>/See footnote table 1.

**RAW PEELED MEAT:** Similarly to the whole shrimp, the raw peeled meats gained weight rapidly, owing to the absorption of water and salt (table 3). Again this increase in weight was accompanied by a decrease in the weight of corrected ash and solids. By the end of the holding period, the peeled meats had lost about one-fifth of their solids content, although the total weight of the peeled meats showed a net increase of about 9 percent.

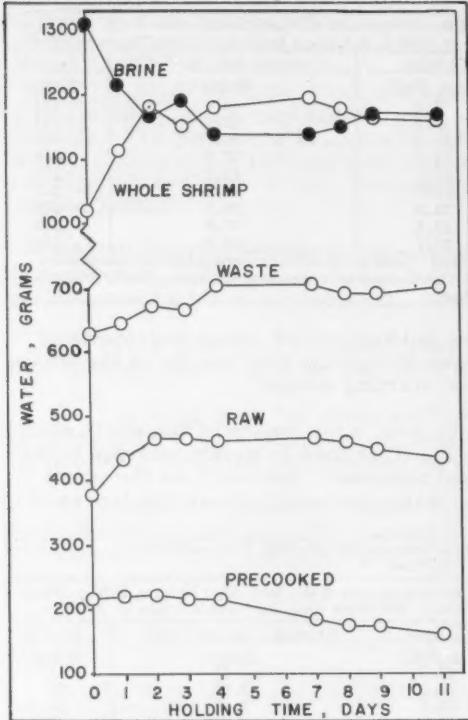


Fig. 2 - The water content of the various components of the shrimp-brine system as affected by the holding time in refrigerated sea water.

**PEELING WASTE:** The peeling waste (table 4) constituted about 65 percent of the shrimp. The waste gained up to 5 percent in weight. This increase was due to the absorption of water and sodium chloride. This increase, however, was very nearly balanced by the loss in corrected

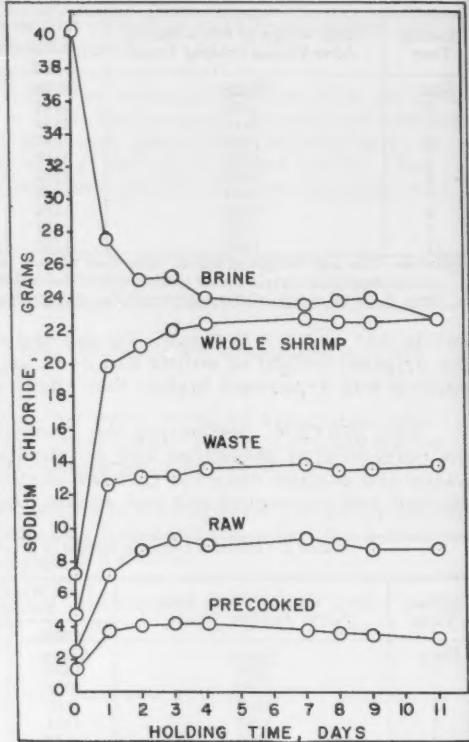


Fig. 3 - The salt content of the various components of the shrimp-brine system as affected by the holding time in refrigerated sea water.

Table 4 - Peeling Waste: Change in Weight of Peeling Waste and Its Component Parts With Time of Holding in Refrigerated Sea Water

Holding Time	Total Weight of Peeling Waste After Various Holding Times	Total Weight of the Components of the Peeling Waste After Holding 1350 g. Whole Shrimp in 1350 g. 3-Percent Brine for Various Times at 30° F.			
		Water	Chloride	Corrected Ash (Ash-NaCl)	Solids <sup>1</sup> /
Days	Grams	Grams	As g. NaCl	Grams	Grams
0	862	627	4.7	39.9	190
1	859	643	12.6	35.1	168
2	855	670	13.1	36.0	166
3	864	664	13.1	33.9	153
4	915	702	13.6	35.6	164
7	904	704	13.8	34.3	152
8	887	689	13.5	35.3	149
9	885	689	13.6	33.6	149
11	893	700	13.8	33.7	145

<sup>1</sup>/See footnote table 1.

ash and solids. As in the whole shrimp, about one-fourth of the weight of the original solids was lost. The decrease in corrected ash was probably the result of leaching of carbonate from the shells, for they became rough to the touch.

**PRECOOKED MEAT:** Reference to figures 2, 3, and 4 show that the precooked meats maintain a constant water content the first few days then decrease in water content, but tend to reach a maximum in absorbed salt and to undergo a continuous decrease in solids content.

Over the 11-day holding period, the precooked meats lost up to 35 percent of their solids content (table 5). Although the data for the raw and precooked meats exhibit almost parallel trends, there is a greater rate of loss from the latter. This greater rate indicates that changes in the raw meats are taking place during holding that result in significant losses of solids during the pre-cook. That this loss may be largely ascribed to leaching of protein-breakdown products during the pre-cook appears to be reasonable, for this view is supported by an earlier finding (Seagran, Collins, and Iverson 1960) that nonprotein nitrogen is continuously being formed at the expense of protein.

Although the percentage composition data are not given for the precooked meats, these data may easily be calculated from the data of table 5. For all practical purposes, the percentage composition of the precooked meats are constant from the 2nd to the 11th day of holding. This indicates that under the conditions of this experiment, the precooked meats will not vary in their water, salt, corrected ash, or solids ratio after the 2nd day of holding.

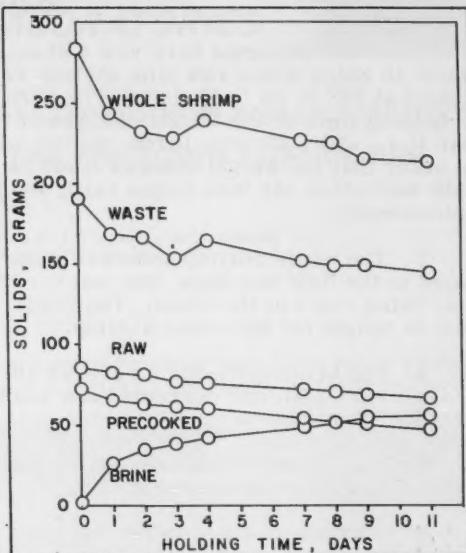


Fig. 4 - The solids content of the various components of the shrimp-brine system as affected by the holding time in refrigerated sea water.

Table 5 - Precooked Meats: Change in Weight of Precooked Meats and Their Component Parts With Time of Holding in Refrigerated Sea Water

Holding Time	Total Weight of Precooked Meats After Various Holding Times	Total Weight of the Components of the Precooked Meats After Holding 1350 g. Whole Shrimp in 1350 g. 3-Percent Brine for Various Times at 30° F.			
		Water	Chloride	Corrected Ash (Ash-NaCl)	Solids <sup>1</sup>
Days	Grams	Grams	As g. NaCl	Grams	Grams
0	292	215	1.4	3.2	72
1	292	220	3.7	3.0	65
2	290	220	4.1	3.1	63
3	284	216	4.2	2.6	61
4	281	214	4.2	3.1	60
7	245	184	3.8	3.0	54
8	231	173	3.6	2.9	52
9	230	173	3.5	2.9	51
11	215	161	3.3	2.8	47

<sup>1</sup>See footnote table 1.

It is likely that the cut-out weight of commercially-canned shrimp is related to the solids content of the precooked meats as defined here. The loss in yield of the solids in this experiment, therefore, can be equated to a loss in yield in the final number of cases of canned shrimp. An inspection of the data for the solids content of the precooked meats (table 5, fig. 4) shows that an 11-day holding period in refrigerated sea water would result in a 35-percent loss in yield. Even after 4 days,

which is about the maximum time a processor could hold shrimp and still maintain good quality, the yield will drop 17-percent; that is, if 100 cases can be obtained using fresh shrimp, then only 83 cases will be obtained after 4 days' holding. Two days in refrigerated sea water is required for proper machine peeling (Collins 1960). After that time, a processor might expect to experience a yield loss of about 2-percent per day upon additional holding.

#### SUMMARY

The work reported here was a study of a system of shrimp and refrigerated sea water in which whole raw pink shrimp were held in 3-percent brine (simulated sea water) at 30° F. up to 11 days. The purpose of the work was to determine the effect of holding time on the weight changes of the various components of the holding system (i.e., whole shrimp, brine, peeling waste, peeled meats, and precooked meats). In order that the weight changes could be interpreted, changes in weight of water, salt, corrected ash (ash minus salt), and solids contents were determined for all components.

1. The whole shrimp absorbed water and salt, the rate of absorption being most rapid in the first few days, and lost corrected ash and solids, the rate of this loss also being rapid at the onset. The result of these two opposing tendencies was a net gain in weight for the whole shrimp.
2. The brine reflected a reverse change from the whole shrimp; that is, water and salt were lost, and corrected ash and solids were gained, with the net change in weight of the brine being a loss.
3. The pattern of changes taking place in both the raw peeled shrimp and the peeling waste was similar to that for the whole shrimp.
4. Over the 11-day period, the precooked meats showed a gain in salt content but a loss in corrected ash, solids, and even water; the result was a net loss in weight. As a function of holding time, the precooked meats had a greater rate of loss of solids than did the raw meats. This observation indicates that the holding period resulted in a change in the raw meats so that the solid material became more soluble during the precook.
5. Assuming that the loss in solids, as defined in this experiment (total weight of precooked shrimp minus weight of water, salt, and corrected ash), is related to the yield of commercially-processed shrimp, a processor will suffer a loss of more than 2 cases per 100 for each day the shrimp are held over the minimum time of 2 days required for proper machine peeling.

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## TECHNICAL NOTE NO. 56 - CHEMICAL COMPOSITION AND LABORATORY FILLET YIELD OF 13 SPECIES OF MIDDLE AND SOUTH ATLANTIC FISH

### ABSTRACT

Chemical composition of fillets and of fillet waste and laboratory fillet yield are presented for 13 species of fish caught off the coasts of the Middle and South Atlantic States.

### INTRODUCTION

Since 1957, a number of miscellaneous determinations have been made at the U. S. Bureau of Commercial Fisheries Technological Laboratory at College Park, Md., on the chemical composition and the laboratory yield of edible meat of certain Middle and South Atlantic fish. The data were taken incidental to the main program of the laboratory and, accordingly, are not extensive. The purpose of this note is simply to make the data available because only limited data have been published on those species.

### METHODS AND ANALYSES

In almost all cases, the fish were obtained by laboratory personnel at coastal fishing ports, were frozen for transportation to the laboratory, and were kept frozen until thawed in air at room temperature for analysis. Protein ( $N \times 6.25$ ), ash, and moisture were determined by methods of the Association of Official Agricultural Chemists (1955). Oil was determined by extraction with 92-percent acetone in a Goldfisch extraction apparatus. The extract was dried, the residue extracted with petroleum ether and filtered into a tared beaker, the petroleum ether evaporated, and the residue in the beaker weighed and calculated as oil.

Season and location of catch have been included, since these variables are associated with differences in chemical composition of fish (Stansby 1954). When the fish differed considerably in size, the data were arranged according to arbitrary size classifications. The weight of edible meat obtained in the laboratory relative to the weight of fish is presented as fillet yield. Chemical analyses were usually performed on fillets from individual fish, which permitted calculation of the means and standard deviations of the means of the various values. With the fillet waste, analyses were performed on composites. The data are presented in tables 1 and 2.



Fig. 1 - Kjeldahl analysis is utilized to determine protein content of fishery products.

Table 1 - Physical Characteristics of Middle and South Atlantic Fish

Species of Fish		Number of Samples	Catch Data		Physical Measurements					
Common Name	Scientific Name		Season	Location	Whole Fish		Fillet Yield			
					Length Mean	S.D. <sup>1/</sup> (Centimeters)	Weight Mean	S.D. <sup>1/</sup> (Grams)	Mean	S.D. <sup>1/</sup> (Percent)
Alewife	<i>Pomolobus pseudoharengus</i>	12	Spring	Maryland	26.5	1.2	270	50	42.7	2.8
Butterfish	<i>Poronotus trilacanthus</i>	4	Summer	Maryland	-	-	110	12	82.8	1.1
Croaker	<i>Micropogon undulatus</i>	4	Summer	Maryland	-	-	284	57	46.0	12.0
		2	Winter	Virginia	30.8	-	494	-	26.7	-
Flounder	<i>Pseudopleuronectes americanus</i>	5	Summer	Maryland	-	-	342	80	51.0	16.0
Grey sea trout	<i>Cynoscion regalis</i>	6	Winter	Virginia	22.8	2.2	175	35	40.7	2.5
King whiting (ground mullet)	<i>Menticirrhus saxatilis</i>	4	Spring	Maryland	-	-	317	70	37.0	3.5
		3	Summer	Maryland	-	-	220	-	35.3	-
		3	Winter	Virginia	26.8	-	351	-	42.6	-
		9	Spring	Georgia	25.1	2.2	176	64	39.0	2.4
Mullet	<i>Mugil cephalus</i>	6	Spring	Maryland	-	-	266	62	32.3	1.8
		5	Spring	Georgia	20.2	1.0	104	15	31.4	3.3
Scup (porgy)	<i>Stenotomus chrysops</i>	6	Spring	Maryland	-	-	514	170	32.5	3.8
		4	Spring	Virginia	29.2	0.8	565	50	30.9	5.4
Sea bass	<i>Centroplistes striatus</i>	5	Spring	Maryland	-	-	443	64	32.8	1.3
		5	Winter	Virginia	25.7	1.8	452	88	30.0	2.0
		5	Winter	Virginia	20.8	0.7	258	-	35.8	2.8
Shad	<i>Alosa sapidissima</i>	6	Spring	Maryland	-	-	1,456	244	46.0	3.7
		2	Spring	Georgia	41.5	-	1,383	-	41.6	-
		2	Spring	Delaware	47.4	-	1,343	-	45.9	-
Spanish mackerel	<i>Scomberomorus maculatus</i>	5	Spring	Florida	42.8	3.0	607	100	58.6	2.5
Spot	<i>Lepostomus xanthurus</i>	4	Summer	Maryland	-	-	151	28	80.0	14.0
Striped bass	<i>Roccus saxatilis</i>	5	Spring	Maryland	29.5	0.7	314	7	36.2	1.4
		4	Spring	Maryland	43.0	1.9	966	79	35.1	1.5

<sup>1/</sup>Standard deviation of the mean.

Table 2 - Chemical Composition of Middle and South Atlantic Fish Fillets and Fillet Waste

Species of Fish	Number of Samples	Chemical Composition								Moisture			
		Protein		Oil		Ash							
		Fillet Mean	S.D. <sup>1/</sup>	Waste Mean	Mean	Fillet S.D. <sup>1/</sup>	Waste S.D. <sup>1/</sup>	Fillet Mean	Waste S.D. <sup>1/</sup>				
		(Percent)											
Alewife	12	17.5	0.6	15.6	4.8	1.6	10.1	1.2	0.0	3.1	76.4	1.6	70.2
Butterfish	4	17.9	1.1	14.4	0.9	0.3	4.6	1.2	0.1	2.8	80.4	0.5	77.4
Croaker	4	17.5	0.3	15.7	2.9	0.5	8.0	1.1	0.1	5.7	78.0	0.7	69.8
	2	14.1	-	14.3	0.4	-	0.4	0.9	-	7.1	84.3	-	77.5
Flounder (blackback)	5	19.9	1.5	16.3	0.3	0.1	2.2	1.2	0.1	5.4	79.5	0.3	75.4
Grey sea trout	6	15.7	1.3	13.6	4.2	1.9	10.8	1.3	0.2	3.1	78.2	1.3	74.5
King whiting (ground mullet)	4	16.6	0.2	14.0	0.7	0.1	1.1	1.0	0.1	3.6	81.7	0.3	80.6
	3	17.5	-	15.2	1.0	-	5.5	1.1	-	3.4	80.3	-	75.0
	3	16.5	-	14.3	6.1	-	11.0	1.1	-	3.6	76.3	-	70.6
	9	17.9	0.7	16.5	2.6	1.3	6.5	1.1	0.1	4.5	78.6	1.4	71.2
Mullet	6	18.1	0.8	17.3	0.2	0.1	1.2	1.0	0.0	8.6	80.2	0.6	72.0
	5	19.0	0.9	18.4	2.0	0.8	6.4	1.2	0.1	5.0	77.4	1.1	70.4
Scup (porgy)	6	18.9	0.8	15.7	5.9	1.7	14.2	1.2	0.1	7.2	73.6	2.1	61.0
	4	18.4	0.1	14.3	4.8	0.4	15.0	1.1	0.0	6.4	75.1	0.6	62.6
Seabass	5	18.2	0.6	16.7	0.8	0.3	5.3	0.9	0.1	6.3	79.5	0.4	69.8
	5	18.5	0.5	15.6	3.0	1.0	9.5	1.0	0.1	2.9	77.8	0.6	73.2
	5	18.0	0.4	14.3	1.3	0.4	6.1	1.1	0.0	3.2	78.8	0.5	74.3
	6	15.7	1.6	13.8	15.2	2.4	19.9	1.3	0.1	3.2	67.5	2.7	61.4
Shad	2	17.5	-	20.7	9.0	-	11.5	1.2	-	3.4	71.3	-	63.8
	2	16.7	-	15.5	13.2	-	17.6	1.3	-	3.6	68.4	-	63.0
Spanish mackerel	5	17.6	0.9	16.0	6.8	1.8	12.4	0.9	0.1	3.6	74.6	1.8	67.4
Spot	4	17.9	0.6	14.8	3.1	0.8	10.6	1.1	0.1	4.6	77.5	0.6	68.9
Striped bass	5	16.6	0.4	15.7	1.5	1.3	4.4	1.0	0.0	4.9	80.7	0.5	74.0
bass	4	18.8	0.3	16.4	2.9	0.6	12.1	1.1	0.1	4.9	77.9	0.6	66.0

<sup>1/</sup>Standard deviation of the mean.

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## SEASONAL VARIATIONS OF PHYSICAL CHARACTERISTICS AND CHEMICAL COMPOSITION OF FISH FROM MIDDLE ATLANTIC STATES

By John G. Wangler\*

### ABSTRACT

Sea bass (Centropristes striatus), flounder or blackback (Pseudopleuronectes americanus), fluke (Paralichthys dentatus), and scup or porgy (Stenotomus chrysops) were obtained in the fresh state from both spring and summer catches at New Jersey coastal ports and the New York City Fulton Fish Market. Data were obtained on the size of the fish; on the percentage yields of fillet, head, frame, viscera, skin, and scales; and on the moisture, protein, oil, and ash contents of those component parts.

### INTRODUCTION

An investigation to determine the physical characteristics and chemical composition of various species of fish obtained from the waters of the Middle Atlantic States is being made by the staff of the U. S. Bureau of Commercial Fisheries Technological Laboratory, College Park, Md. Such information is of value to fish processors, nutritionists, and members of the medical profession. The chemical composition of the nonedible portion of fish is of value in the pet-food and other animal-feed industries.

Variations in physical characteristics and chemical composition are considered important, since it has been generally realized for some time that these factors differ considerably, not only from species to species but often to an even greater extent from one fish to another of the same species. These variations--according to Atwater (1892), Tressler and Lemon (1951), and Stansby (1954)--may be due to the season of the year when the fish are caught, the geographical area in which the fish are located, the age of the fish, or other factors that have not been identified. For composition data to be of real value, then, it is necessary to determine the extent of differences that may exist.

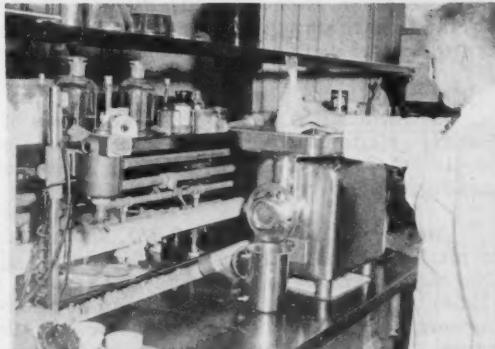


Fig. 1 - To prepare samples, a Hobart grinder is used.

In this report information is presented on the seasonal variations in the physical measurements and the chemical composition of four species of commercially important fish of the Middle Atlantic States.

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## EXPERIMENTAL PROCEDURE AND RESULTS

**SAMPLING:** Fresh fish were obtained from both spring and summer catches from New Jersey coastal ports and the New York City Fulton Fish Market. The species were sea bass (*Centropristes striatus*), flounder or blackback (*Pseudopleuronectes americanus*), fluke (*Paralichthys dentatus*), and scup or porgy (*Stenotomus chrysops*). The fish were packed in ice and transported to the laboratory, where they were stored in polyethylene bags at approximately  $-12^{\circ}\text{C}$ . ( $10.4^{\circ}\text{F}$ .) until analyzed.

**PHYSICAL MEASUREMENTS:** After being thawed at room temperature (no drip occurred), each fish weighed and measured for length, depth, and thickness. Length was determined by measuring the fish from the snout to the tip of the tail. Individual weights were determined for the whole fish and for various component parts of the fish, including fillet, viscera, frame, head, skin, and scales. The term frame is used to indicate the total weight of the beheaded skeleton after filleting, and includes tail,

Table 1 - Physical Measurements and Yields of Component Parts of Middle Atlantic Fish											
Description of the Whole Fish Species	Season of Catch	Item	Physical Characteristics				Yield of Component Parts				
			Length (Centimeters)	Depth (Thickness) (Centimeters)	Weight (Grams)	Fillet	Viscera	Frame	Head	Skin	
Sea bass <sup>1/</sup> ( <i>Centropristes striatus</i> )	Spring	Mean of 9 fish	32.8	8.0	4.9	522	33.5	3.3	16.0	36.0	6.8
		Standard deviation	2.4	0.8	0.5	87	2.1	0.8	2.9	0.8	2.4
		Mean of 11 fish	32.9	11.1	4.3	866	35.4	4.4	18.7	37.0	6.4
	Summer	Standard deviation	2.3	0.6	0.5	111	3.7	2.3	2.7	3.4	2.1
		Significance of F test <sup>2/</sup>	0.7	0.7	0.7	None	0.7	None	0.7	0.7	0.5
		Seasonal difference of means	5.4	2.9	1.4	344	1.9	0.5	0.3	0.2	0.2
Flounder or blackback <sup>3/</sup> ( <i>Pseudopleuronectes americanus</i> )	Spring	Mean of 10 fish	11.9	1.2	0.8	242	10.8	0.5	2.0	1.1	0.7
		Standard deviation	1.3	1.2	0.2	131	4.8	2.3	2.0*	0.8	2.2
		Mean of 6 fish	94.0	21.6	4.9	2,180	48.0	8.5	18.5	9.3	13.7
	Summer	Standard deviation	0.8	0.9	0.1	116	2.0	1.3	1.5	1.1	1.0
		Significance of F test <sup>2/</sup>	0.7	0.7	0.7	None	0.7	None	0.7	0.7	0.5
		Seasonal difference of means	17.1	1.9	1.0	1,595	23.1	1.0	17.0	9.5	1.5
Fluke <sup>3/</sup> ( <i>Paralichthys dentatus</i> )	Spring	Mean of 6 fish	41.3	18.9	2.3	904	32.0	1.8	26.8	19.8	0.1
		Standard deviation	3.0	0.7	0.3	107	2.8	0.4	1.7	1.6	0.5
		Mean of 6 fish	50.7	19.1	3.8	1,438	47.5	5.8	18.6	15.6	7.4
	Summer	Standard deviation	2.1	0.7	0.1	126	7.7	0.5	0.6	0.6	0.5
		Significance of F test <sup>2/</sup>	0.7	0.7	0.7	None	0.7	None	0.7	0.7	0.5
		Seasonal difference of means	6.4	2.2	0.5	574	3.3	0.8	4.0	1.7	0.1
Scup or porgy <sup>4/</sup> ( <i>Stenotomus chrysops</i> )	Spring	Mean of 8 fish	33.0	11.8	4.5	865	30.8	7.1	20.3	30.7	6.4
		Standard deviation	2.4	0.8	0.5	133	3.7	1.8	1.1	1.1	1.0
		Mean of 7 fish	30.9	10.5	3.7	474	31.9	8.4	14.3	30.3	6.5
	Summer	Standard deviation	1.5	0.7	0.2	88	1.1	1.3	1.6	1.3	0.7
		Significance of F test <sup>2/</sup>	0.7	0.7	0.7	None	0.7	None	0.7	0.7	0.5
		Seasonal difference of means	3.0	1.3	0.7	191	1.3	0.8	0.0	0.4	1.4

<sup>1/</sup> Spring catch obtained in April 1958, near Cape May, N. J.; summer catch in September 1958, from the Palisade Fish Market, New York City, and fish were caught off southern Massachusetts.

<sup>2/</sup> Spring catch obtained in April 1958, near Cape May, N. J.; summer catch in September 1958, from the Palisade Fish Market, New York City, and fish were caught off southern Massachusetts.

<sup>3/</sup> Spring catch obtained in April 1958, near Cape May, N. J.; summer catch in July 1958, from the Palisade Fish Market, New York City, and fish were caught off southern Massachusetts.

<sup>4/</sup> Spring catch obtained in April 1958, near Cape May, N. J.; summer catch in July 1958, from the Palisade Fish Market, New York City, and fish were caught off southern Massachusetts.

\*Indicates a significant difference between spring and summer values at a 5-percent level of probability.

†Indicates a significant difference between spring and summer values at a 10-percent level of probability.

‡A statistical test used to determine if differences between measurements may be considered as real.

vertical and dorsal fins, and adhering meat. The term loss is used to indicate the total weight of each fish less the determined sum of the weights of all component parts of that fish. A percentage yield of component parts was determined by dividing the weight of each component part by the total weight of each fish and multiplying by 100. Data obtained on the physical measurements are tabulated in table 1.

**CHEMICAL ANALYSES:** The fillets of each fish were individually ground in a Hobart grinder, ground further in a Lourdes multimixer, and stored in glass jars at  $-10^{\circ}\text{C}$ . ( $14^{\circ}\text{F}$ .) until analyzed. Composites of the inedible component parts were similarly prepared for analysis.

Moisture, protein ( $N \times 6.25$ ), and ash determinations were conducted according to methods of analysis of the Association of Official Agricultural Chemists (1955). The oil content was determined by a slight modification of the method of Damberg (1956). The method used consisted of extraction of the sample with a mixture of 92 percent acetone and 8 percent water for 4 hours in a Goldfisch fat extraction apparatus. The solvent mixture then was evaporated, and the residue was dissolved in petroleum ether. The solution was filtered through No. 42 Whatman filter paper, the petroleum ether was evaporated, and the residue was weighed and calculated as oil. Data on chemical composition are tabulated in tables 2 and 3.

Table 2 - Chemical Composition of Fillets From Middle Atlantic Fish

Description of the Fish Species	Season of Catch	Item	Proximate Composition			
			Moisture	Protein	Oil	Ash
Sea bass ( <i>Centropristes striatus</i> )	Spring	Mean of fillets from 9 fish	78.5	18.9	1.62	1.15
		Standard deviation	1.2	0.7	1.04	0.10
	Summer	Mean of fillets from 9 fish	77.3	18.3	2.92	1.20
		Standard deviation	1.1	0.5	1.43	0.06
	Significance of F test		1/	None	1/	None
	Seasonal difference of means		1.2	0.6	1.30	0.05
Flounder or blackback ( <i>Pseudopleuronectes americanus</i> )	Spring	Mean of fillets from 6 fish	80.8	17.1	0.23	1.29
		Standard deviation	0.9	0.5	1.11	0.12
	Summer	Mean of fillets from 6 fish	75.4	19.9	0.83	1.21
		Standard deviation	0.5	0.9	0.46	0.05
	Significance of F test		2/	2/	1/	None
	Seasonal difference of means		5.4	2.8	0.60	0.08
Fluke ( <i>Paralichthys dentatus</i> )	Spring	Mean of fillets from 6 fish	79.7	18.8	0.32	1.08
		Standard deviation	0.7	0.9	0.12	0.21
	Summer	Mean of fillets from 6 fish	76.8	20.0	1.02	1.13
		Standard deviation	0.6	0.4	0.41	0.08
	Significance of F test		2/	1/	2/	None
	Seasonal difference of means		2.9	1.3	0.70	0.05
Scup or porgy ( <i>Stenotomus chrysops</i> )	Spring	Mean of fillets from 8 fish	75.4	18.9	4.06	1.20
		Standard deviation	1.0	0.5	1.19	0.07
	Summer	Mean of fillets from 7 fish	77.0	19.1	1.21	1.30
		Standard deviation	0.6	0.4	0.61	0.11
	Significance of F test		2/	None	2/	2/
	Seasonal difference of means		1.6	0.2	2.85	0.10

1/ Indicates a significant difference between spring and summer values at a 5-percent level of probability.

2/ Indicates a significant difference between spring and summer values at a 1-percent level of probability.

Table 3 - Chemical Composition of Inedible Components From Middle Atlantic Fish

Description of the Fish Species	Season of Catch	Component <sup>1/</sup>	Proximate Composition			
			Moisture	Protein	Oil	Ash
Sea bass ( <i>Centropristes striatus</i> )	Spring	Viscera	74.8	14.7	7.98	1.45
		Frame	69.8	15.7	6.22	7.45
		Head	69.7	16.2	5.03	7.40
		Skin	73.4	19.9	6.43	0.87
		Scales	62.4	22.6	0.08	14.50
	Summer	Viscera	76.5	13.0	6.91	1.40
		Frame	66.3	17.4	7.73	8.41
		Head	70.4	16.6	5.31	7.85
		Skin	68.7	21.7	9.61	1.45
		Scales	44.1	30.3	0.42	25.83
Flounder or blackback ( <i>Pseudopleuronectes americanus</i> )	Spring	Roe	76.5	16.9	3.82	1.55
		Viscera	81.4	10.1	2.79	2.41
		Frame	77.0	16.6	1.11	6.93
		Head	75.2	15.8	1.74	6.13
		Skin	77.1	19.7	0.89	1.49
	Summer	Scales	62.9	21.4	0.46	15.17
		Viscera	71.1	12.9	9.39	3.99
		Frame	67.5	18.1	7.40	7.41
		Head	69.9	16.5	5.87	6.13
		Skin	68.2	18.9	11.01	1.69
Fluke ( <i>Paralichthys dentatus</i> )	Spring	Scales	61.1	24.3	0.35	14.83
		Roe	-	-	-	-
		Viscera	82.4	13.0	1.43	1.11
		Frame	76.6	15.7	2.20	4.82
		Head	73.0	17.2	3.34	6.04
	Summer	Skin	75.7	20.9	1.05	0.95
		Scales	53.5	28.8	0.17	18.53
		Viscera	78.5	13.5	5.19	1.17
		Frame	67.1	18.0	6.92	6.91
		Head	69.2	17.6	5.35	7.49
Scup or porgy ( <i>Stenotomus chrysops</i> )	Spring	Skin	68.0	23.6	6.45	1.38
		Scales	49.1	33.2	0.31	18.96
		Roe	-	-	-	-
		Viscera	70.1	12.1	6.93	7.18
		Frame	60.9	17.3	15.64	6.81
	Summer	Head	61.2	15.5	13.98	8.93
		Skin	61.1	18.3	20.79	0.93
		Scales	37.9	30.3	0.46	33.12
		Viscera	73.1	13.0	2.88	6.42
		Frame	68.2	17.1	8.63	6.47

1/ Composites of each component part.

## DISCUSSION

**VARIATIONS IN PHYSICAL MEASUREMENTS:** Within each species, individual fish varied in size and percentage yield of the component parts. Of the 4 species studied, 3 from the summer catch--sea bass, flounder, and fluke--were larger than the same species from the spring catch. On the other hand, scup or porgy were larger in the spring.

Any difference in size of fish was accompanied by differences in the weight of the component parts. However, the changes in weight were not proportional to changes in the size of the fish. Therefore, the percentage yields of the different component parts varied seasonally. Generally, spring-caught fish contained higher percentage of frame and head coupled with lower percentage of viscera and fillet compared to the summer-caught fish. An exception was noted for scup, where seasonal differences were small in the proportions of the component parts.

**VARIATIONS IN CHEMICAL COMPOSITION:** The mean oil content of sea bass, flounder, and fluke was significantly lower for the spring catch as compared to the summer catch and was accompanied by a correspondingly higher moisture content. A similar relationship existed between the oil content and the moisture content of scup except that in this case, a significantly greater oil content and a correspondingly lower moisture content were obtained in the spring catch as compared to the summer catch. Similar ratios of oil and water content were reported by Clark and Almy (1920).

The mean protein content of flounder, fluke, and scup for the summer catch was significantly greater than that for the spring catch. The seasonal differences in the mean protein content for sea bass and ash content of the four species were not significant within species.

## SUMMARY

Results obtained from the study of the seasonal differences in physical measurements and chemical composition of four species of Middle Atlantic fish indicated that sea bass, flounder, and fluke caught in the summer were larger than these species from the spring catch. The mean size of scup from the spring catch, however, was larger than that of fish from the summer catch. Seasonal changes in yield of component parts were not proportional to changes in the size of the fish. Important differences noted in chemical composition were significantly higher oil content coupled with lower moisture content for summer-caught sea bass, flounder, and fluke and spring-caught scup as compared with spring-caught sea bass, flounder, and fluke, and summer-caught scup.

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Note: The author thanks Mrs. S. W. Nealis for the statistical analysis of the data and Cary J. Hansel for his assistance in the preparation of the samples and for conducting part of the chemical analyses.



# TRENDS AND DEVELOPMENTS

## American Samoa

### TUNA LANDINGS, JANUARY-APRIL 1960:

Tuna landings by Japanese and South Korean fishing vessels for the United States-owned tuna cannery in American Samoa amounted to 1,475,000 pounds in March and 2,094,000 pounds in April 1960. The January-April 1960 total of 9,150,000 pounds was up about 10.7 percent from the 8,267,000 pounds landed in the same period of 1959.

American Samoa Tuna Landings,  
March-April 1960 with Comparisons

Species	March		April		Jan.-Apr.	
	1960	1959	1960	1959	1960	1959
Albacore	1,176	1,357	1,722	1,793	7,702	6,277
Yellowfin	247	392	254	436	1,123	1,635
Big-eyed	52	97	112	142	315	355
Skipjack	1/	-	6	1/	10	1/
Total	1,475	1,846	2,094	2,371	9,150	8,267

1/ Less than 500 pounds.  
Note: Majority of the tuna was landed by Japanese long-line vessels; some was landed by South Korean and Samoan long-line vessels.



## California

### ATTEMPT BEING MADE TO RESTORE SOUTHERN CALIFORNIA KELP BEDS:

In order to restore the Southern California coast's once valuable kelp beds, warm-water kelp is being planted. The kelp beds are near extinction because of damage caused by three years of sub-normal water temperatures. The kelp that is being planted is brought from off the coast of Lower California, Mexico.

A University of California biologist states that a few plants are being planted in the hope that if the water continues warm, the spores will hold and grow.

The spores normally float up from the south during warm water periods. Divers transplant the southern kelp by tying it to rocks with nylon cords, to hold it until it attaches itself.

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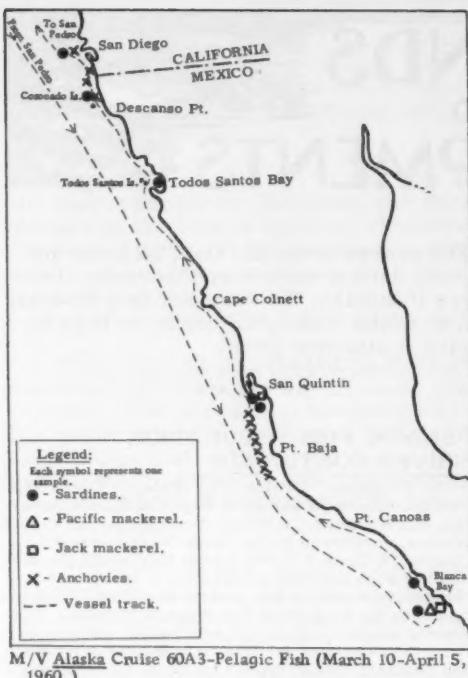
### PELAGIC FISH POPULATION SURVEY CONTINUED:

M/V "Alaska" Cruise 60A3-Pelagic Fish: The coastal waters off northern Baja California, Mexico, and southern California from Playa Maria Bay, Mexico, northward to San Diego were surveyed (March 18-April 5, 1960) by the California Department of Fish and Game research vessel Alaska, to obtain live sardines for genetic studies in cooperation with the U. S. Fish and Wildlife Service. The genetic studies include (a) serological tests to delimit the ranges of sardines possessing northern and southern blood "types" (prior to the 1959 sardine fishing season the "northern type" was found off central California and the "southern type" off southern California. Since the 1959 season opened in September, all sardine samples collected off California have been of the northern type. Sardines collected in the area extending from Sebastian Vizcaino Bay southward to Magdalena Bay on the February 1960 Pelagic Fish Cruise 60A2 were of the southern type); and (b) detailed morphometric studies, on the above fish, to find morphological characters which may be related to genetic types. Other objectives were (1) to experiment with Japanese mercury vapor lights as a means of improving fish attraction to lights; (2) to make preliminary gear experiments to improve pelagic fish sampling; and (3) to sample sardines, Pacific mackerel, jack mackerel, and anchovies to determine their distribution, relative number, and their ages.

Live sardines were collected in Sebastian Vizcaino Bay, San Quintin Bay, and Todos Santos Bay. An additional live sardine sample was obtained from a Mexican bait hauler at Ensenada. Although all blood tests have not been completed, the Ensenada sample was found to consist of northern-type fish.

From a total of 66 light stations, 6 sardine, 4 anchovy, 2 jack mackerel, and one Pacific mackerel samples were taken.

The vessel scouted 303 miles during which 358 anchovy, one sardine, and one Pacific mackerel schools were observed. Anchovies were seen in large quantities between Sacramento Reef and Cape San Quintin. In addition to the anchovy schools



counted, there were nearly continuous bands of anchovies which were not separate enough to count. These fish were about 3 to 4 inches in length and were negatively phototropic. (Fish did not respond to light stations made in the area of school groups.)

On 14 light stations a 500-watt Japanese mercury vapor lamp was compared with a 1,500-watt incandescent light for relative fish attraction effectiveness. The lights were suspended over the water with a mercury vapor lamp placed amidships on one side of the vessel and an incandescent lamp placed in a corresponding location on the opposite side. The lights were turned on simultaneously and burned about one hour at each station. Although both types attracted sardines, anchovies, sauries, and pelagic red crabs, the animals did not show a preference for either. More extensive tests are planned.

A different method of catching fish under the light was tried by using a modified lampara net. Results provided ideas for further experimentation. An experimental set with a variable mesh gill net successfully captured 100 sardines and 4 barracuda of a deep school in a 15-minute set.

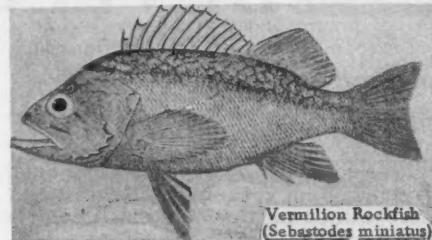
Sea-surface temperatures ranged from 54.1° F. at Cape Colnett to 62.5° F. at Point Descanso. A large number of readings ranged between 57° and 59° F.

*Note: Also see Commercial Fisheries Review, June 1960, p. 22.*

\* \* \* \* \*

### ROCKFISH STUDY OFF SOUTHERN CALIFORNIA COAST CONTINUED:

**M/V "Nautilus" Cruise 60N1-Rockfish:** The inshore waters around Santa Barbara Island were surveyed by the California Department of Fish and Game research vessel *Nautilus* on January 18-22, 1960, to obtain sub-adult and young adult sizes of the vermilion rockfish (*Sebastodes miniatus*) for determining size and age at maturity.



Vermilion Rockfish  
(*Sebastodes miniatus*)

Fifty vermilion rockfish, in the desired size range, were obtained by hook-and-line fishing. These were caught on the bottom at a depth of 30-35 fathoms off Santa Barbara Island. Scales and otoliths were taken from all specimens.

Information was obtained on other species of rockfish. Whitebelly rockfish (*S. vexillaris*) were the most abundant species found in association with vermilion rockfish.

Ocean whitefish (*Caulolatilus princeps*) were frequently caught just above the bottom; and numbers of Pacific mackerel (*Pneumatophorus diego*) were taken at midwater depth.

\* \* \* \* \*

### CALIFORNIA HALIBUT TAGGING STUDIES OFF SOUTHERN AND BAJA CALIFORNIA:

**M/V "Nautilus" Cruise 60N2-Sportfish:** The area off southern California from Ventura to Oceanside was surveyed by the California Department of Fish and Game's research vessel *Nautilus* on February 11-18, 1960, to secure California halibut (*Paralichthys californicus*) for (a) tagging; (b) morphometric studies; and (c) length-weight and age studies. Other objectives were (1) to collect samples of other species found in association with California halibut; and (2) to determine the relative abundance of California halibut inside and outside of the three-mile limit in certain areas.

A total of 81 hauls with a trawl net produced 888 California halibut for tagging. An additional 1,494 halibut were captured but were considered too small (smaller than 15½") or were in too poor a condition for tagging. All of the large damaged fish and samples of the smaller fish were saved for morphometric and food and age studies.

The California halibut tagged averaged 19½ inches in length and 20 percent were of commercial legal size (22 inches). This percentage was more than twice that encountered during 1959 trawling. Nine halibut were tagged off Oceanside, 561 in the

Newport-Long Beach area, 124 off Zuma Beach and 194 off Hueneme.

Fishing operations were hampered in the Zuma Beach area by vast quantities of broken kelp fronds and holdfasts that were picked up from the bottom by the trawl net. Dragging in the same area and depth later produced large quantities of kelp but the pieces were noticeably smaller.

In most cases, all bony fish other than California halibut were saved and processed at the California State Fisheries Laboratory. Lengths, weights, sex, and state of maturity were obtained for most of the 1,926 specimens saved.

**M/V "N. B. Scofield" and "Nautilus" Cruises 60S1 and 60N3-Sportfish:** The inshore waters from Huntington Beach, Calif., to San Quintin Bay, Baja Calif., were surveyed (March 2-20, 1960) by the Department's research vessels N. B. Scofield and Nautilus (1) to obtain California halibut (*Paralichthys californicus*) for tagging, length-weight-age-maturity data, morphometric studies, and study of food habits; and (2) to collect samples of ocean life found in association with halibut.

The N. B. Scofield and the Nautilus were able to complete 168 drags with trawl nets. Of 3,189 California halibut taken, 2,079 were tagged. Fish shorter than 15½ inches total length were not tagged unless in unusually good condition. The greater portion of the California halibut tagged up to this year have been of the smaller sizes and additional

small fish were not needed. A total of 400 of those tagged were 22 inches or longer (commercial size limit 22 inches).

Approximately 1,400 pounds of fish and shellfish caught along with the California halibut were retained for laboratory examination. One shovel-nose guitarfish (*Rhinobatos productus*) was larger than any previously examined.

Diamond turbot (*Hypsopsetta guttulata*), horny-head turbot (*Pleuronichthys verticalis*), and fantail sole (*Kystreurus liolepis*) were the most common bony fish found associated with California halibut. In some areas, usually where the warmest water prevailed, large catches of the various flatfish, shovel-nose guitarfish, bat ray (*Myliobatis californicus*), and thornback (*Platyrhinoidis triserata*) were taken. Frequently, one or two electric rays (*Torpedo californica*) and angel sharks (*Squatina californica*) were included. Angel sharks appear to be a serious predator on halibut, as a number of halibut had scars of angel shark bites in various stages of healing.

Sharks, skate's, and rays were counted and jettisoned. Shovel-nose guitarfish were most numerous followed by bat rays. Totals were: shovel-nose 1,668, bat ray 860, thornback 584, butterfly ray (*Gymnura marmorata*) 130, angel shark 98, diamond stingray (*Dasyatis dipterura*) 35, and electric ray 12.

Two large female angel sharks gave birth to a number of live young when boated. One yielded 11 young, the highest count. All were active and able to swim immediately.

Round stingrays (*Urolophus halleri*), very common in California waters, were seldom caught in Mexico. Round stingrays cause considerable sting damage to all species of fish when confined together in the trawl net. Bat rays on the other hand do little sting damage, but their bulk and weight may harm fish that need to be in good shape for tagging.



## Cans--Shipments for Fishery Products

### BY AREA IN 1959:

In 1959, out of total shipments of 115,479 tons of steel for use in the manufacture of cans for fishery products, the Pacific Area (including Hawaii)--where the tuna, California, and salmon canneries are concentrated--utilized 81,809 tons or 70.8 percent. The Pacific Area was followed by the Eastern Area (New Eng-



land, Middle Atlantic, South Atlantic, and Puerto Rico) with 29,299 tons or 25.4 percent. The Maine sardine canneries are concentrated in New England and a tuna cannery operates in Puerto Rico. The Central Area (includes Gulf States)--where the bulk of the shrimp-canning industry is concentrated--used only 4,371 tons or 3.8 percent. The over-all total of 115,479 tons was down 6.6 percent from the preceding year due primarily to a sharp drop of 8.4 percent in the amount of steel used for fish cans in the Pacific Area where the packs of California sardines and salmon were down.

Shipments of steel for the manufacture of cans for fishery products on a quarterly basis were heaviest during the third quarter for the Eastern and Pacific Areas, but for the Central Area the heaviest shipments were made in the second quarter. In the east, 37.5 percent or 10,990 tons out of a total of 29,299 tons were consumed in the third quarter. The Pacific Area used 26,775 tons (32.7 percent of the 81,809-ton total) during the third quarter. The Central Area used 1,740 tons (39.8 percent) in the second quarter and 1,485 tons (34.0 percent) in the third quarter.

*Note: Also see Commercial Fisheries Review June 1959 p. 33.*

\* \* \* \* \*

#### JANUARY-MARCH 1960:

Total shipments of metal cans during January-March 1960 amounted to 22,023 short tons of steel (based on the amount of steel consumed in the manufacture of cans) as compared with 19,457 tons in the same period a year ago. Canning of fishery products in January-March this year was confined largely to tuna, Gulf oysters, and Pacific jack mackerel. Increased shipments of metal cans during January-March this year as compared with the same months in 1959 were probably due to the sharp increase in the California pack of canned jack mackerel.

*Note: Statistics cover all commercial and captive plants known to be producing metal cans. Reported in base boxes of steel consumed in the manufacture of cans, the data for fishery products are converted to tons of steel by using the factor 23.0 base boxes of steel equal one short ton of steel.*



#### Central Pacific Fisheries Investigations

##### FUTURE RESEARCH ON PACIFIC TUNAS POINTED TOWARDS SOLUTION OF PRACTICAL PROBLEMS:

During the first ten years (1950-1959), the oceanographic, marine biological, and fishery research conducted by the U. S. Bureau of Commercial Fisheries Hono-

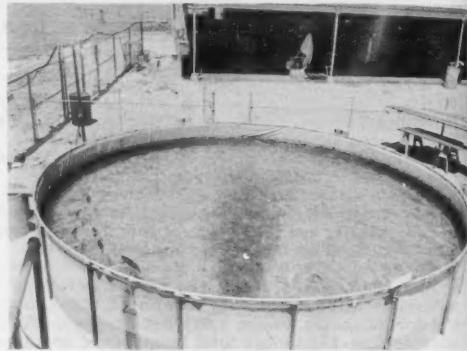


Fig. 1 - Tank at Bureau of Commercial Fisheries Honolulu Biological Laboratory where behavior of skipjack tuna is being studied. Note small skipjack swimming on left side of tank.

lulu Biological Laboratory was primarily exploratory in nature. Studies were made of the distribution and abundance of deep-swimming yellowfin, big-eyed, and albacore tuna in the Central Pacific equatorial region (1950-1956), of both surface and deep-swimming albacore in the North Central and Northeastern Pacific (1954-1960), and of surface school skipjack in the Northeastern French Oceania or the Marquesas (1956-1960), and in Hawaiian waters (1952 to present). In each of the areas, studies covered oceanographic observations, plankton and forage samples, and tuna biology studies, including spawning, life history, growth, and migration. Various descriptive and analytical reports describing these studies have been published. The final series of reports for the North Pacific albacore and the Marquesan studies are scheduled for publication during 1960.

Completion of the exploratory phases has resulted in a regrouping and redirection of the Laboratory's research. In recognition of the need to produce more fundamental knowledge for the solution of

immediate practical problems, as well as those of the future, effort will be directed towards increasing efficiency of capture and increasing knowledge of the biology of the tunas, identity of the stocks, and distribution and abundance of the Pacific-wide tuna resources.

Research leading to increased efficiency of capture will involve behavior studies at sea and of captive tuna held



Fig. 2 - A captive six-pound skipjack tuna swimming in tank at Honolulu Biological Laboratory. This is first tank skipjack have been held in captivity for more than a few hours or have been induced to feed.

in ponds and tanks; evaluation of potential live-bait supplements, and evaluation and refinement of existing and the development of additional prediction techniques. Each of these studies is dependent, in part, on knowledge relating to the biology of the tuna; knowledge of their spawning, life history, growth, and size distribution--all of which will receive increased attention.

Although tagging experiments have yielded valuable information to the identity of tuna stocks as well as on migrations, they are expensive and limited to areas where there are fisheries. Studies of genetic characteristics and blood groups were initiated in May 1960. The presence or absence of specific genetic characteristics in fish from different areas indicates whether or not interbreeding occurs, and thus whether one or more distinct populations are involved.

In order to pursue studies of the Pacific-wide distribution and abundance of the tunas and of the variations in the dis-

tribution and abundance as related to the environment, all available tuna catch and oceanographic station data are being assembled. These data, as received and as necessary, will be transferred to punch cards. In some cases, duplicate decks of punch cards are available from other institutions. As the files become complete for particular areas, average yield figures per unit area, per unit time, and per unit of effort will be prepared. In addition, the average values for units of area and time for selected oceanographic features will be similarly prepared. Examination of both sets of data may be expected to reveal problems and to suggest relationships which will require more intensive study.

In addition various exploratory-theoretical studies are under way or planned. Through attempts to generalize and synthesize existing knowledge, it is hoped to push understanding beyond present levels, perhaps identifying critical observations or experiments to be made in the laboratory or at sea.



### Federal Purchases of Fishery Products

#### DEPARTMENT OF DEFENSE PURCHASES, JANUARY-APRIL 1960: Fresh and Frozen Fishery Products: For the use of the Armed Forces under

Table 1 - Fresh and Frozen Fishery Products Purchased by Military Subsistence Supply Agency, April 1960  
with Comparisons

				Value			
Quantity				April		Jan. - Apr.	
April	Jan.	-Apr.		1960	1959	1960	1959
1,646	1,218	1,6,294	17,137	(\$1,000)	\$958	982	3,688
							3,782

the Department of Defense, 1.6 million pounds (value \$958,000) of fresh and frozen fishery products were purchased in April 1960 by the Military Subsistence Supply Agency. This was lower than the quantity purchased in March by 14.9 percent, and 24.8 percent under the amount purchased in April 1959. The value of the purchases in April 1960 was lower by 11.4 percent as compared with March and 2.4 percent less than for April 1959.

During the first four months of 1960 purchases totaled 6.9 million pounds (val-

ed at \$3.7 million)--a decrease of 3.4 percent in quantity and 2.5 percent in value as compared with the similar period in 1959.

Prices paid for fresh and frozen fishery products by the Department of Defense in April 1960 averaged 58.2 cents a pound, about 2.3 cents higher than the 55.9 cents paid in March and 13.3 cents more than the 44.9 cents paid during April 1959.

#### Canned Fishery Products: Purchases of canned fishery products were

Product	Quantity		Value			
	April 1960	Jan.-Apr. 1959	April 1960	Jan.-Apr. 1959	April 1960	Jan.-Apr. 1959
Tuna..	13	(1,000 lbs.)	539	1,282	1,408	8
Salmon..	-	-	-	-	271	581
Sardine..	15	15	61	280	6	6
					26	46

very light during April this year. In the first four months of 1960, purchases of canned tuna were lower by 9.1 percent and canned sardines were down about 78.2 percent as compared with the same period in 1959. No canned salmon was purchased during January-April 1959 and 1960.

Note: Armed Forces installations generally make some local purchases not included in the data given; actual total purchases are higher than indicated because local purchases are not obtainable.



#### Frozen Processed Fish and Shellfish Consumption

##### IN INSTITUTIONS AND PUBLIC EATING PLACES IN LOS ANGELES:

Information from restaurants and institutions concerning the consumption of frozen processed fish and shellfish was the objective of a survey in 10 major cities recently completed by Crossley S-D Surveys, Inc. for the Bureau of Commercial Fisheries. Los Angeles stands sixth among the ten cities surveyed in terms of percentage of all establishments buying frozen processed fishery products, and first in the variety of species purchased. Twenty-one species were included in Los Angeles purchases. Almost



three-fourths of all Los Angeles restaurants and institutions buy fish and shellfish, many of which buy them frozen. A breakdown of the types of frozen fishery products purchased during the survey month of November 1958 by the establishments that do serve those products showed that 36 percent was frozen processed fillets and steaks, 35 percent was frozen processed shellfish, and 20 percent was frozen portions, with the remainder unspecified varieties.

The incidence of use of frozen processed products was greater among institutions than among public eating places.

Among purchasers of frozen processed fish, more than a third bought halibut steak. This compares with 21 percent that purchased cod fillets; 20 percent halibut fillets; and 11 percent salmon steaks. Even though halibut fillets ranked third in choice, this item led the other four in poundage. In the shellfish category, one-third of the establishments using them bought frozen raw shrimp while almost the same number bought breaded shrimp. Raw scallops were another popular purchase.

Portions were a popular purchase with one-fifth of all the establishments in the city. This group preferred the fish uncooked whether breaded or plain, and Los Angeles ranked fourth among the ten cities in the percentage of establishments buying portions. Almost two-thirds of the purchasers of portions said they were currently buying about the same amount as a year before. Nineteen percent said

they purchased more than the previous year, while fewer than 8 percent said they bought less.

According to the survey, almost all establishments serving frozen processed fish, shellfish, and portions were satisfied with the preparation, quality, and condition of the products. With reference to portions only, one-fifth of the users felt that the quality of portions was better than that of other frozen processed fish; three-fourths rated the quality as about the same; 1 percent considered the quality poorer.

Major advantages cited for portions were:

	Percentage of Users Citing
"Time-saving"	49
"Convenience, ease of preparation"	36
"Economy, no waste"	30
"Uniform size"	22

Portions came under greater scrutiny than any other product. About one-third of users noted some disadvantage to using portions, yet 40 percent said their customers liked portions better than the processed fish. This is compared to 41 percent who claimed their customers liked portions about the same as processed fish and the 3 percent who said they liked portions less than other types.

Frying was the preferred method of preparing and serving fish among Los Angeles establishments. The average establishment served 53 percent of its fish fried, 24 percent broiled, and 18 percent baked.

In the shellfish category, the typical establishment served two-thirds of its shellfish fried, about 63 percent of its portions fried, while only 21 percent of portions was served baked. Four-fifths of the establishments using portions cooked them while frozen.

Portions received extra attention in this survey because of their growing acceptance in the restaurant and institutional trade. Of the establishments using portions, 15 percent said they were more expensive than other forms of frozen processed fish. A large majority of users considered them less expensive, or rated them about the same.

Five-sixths of the Los Angeles purchasers said they specified the kind of fish when ordering portions. Only 3 percent suggested new varieties of portions that were not then available. Establishments that did not use portions gave a number of reasons:

- "They sold comparatively little fish"
- "They served other types of fish"
- "Portions were too expensive"

Establishments in Los Angeles tended to buy frozen processed fishery products from both frozen-food distributors and fishery wholesalers. Fifty-two percent of the suppliers were within 10 miles of the establishment, while another 45 percent were between 10 and 50 miles away. In almost half the cases, deliveries were made once a week, while one-fourth got delivery between 2 and 4 times a week, and most all were satisfied with the services of the suppliers.

Five-eights of the profit-making establishments which expressed an opinion considered frozen processed fish and shellfish more profitable than other protein foods.

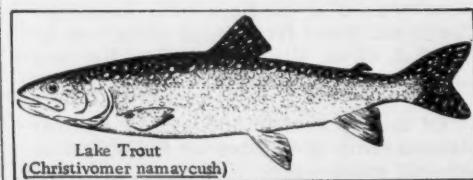
Note: See Commercial Fisheries Review, January 1960 p. 32.



## Great Lakes

### LAKE TROUT RESTOCKING PROGRAM:

Approximately 92,000 yearling lake trout were released in Lake Michigan



early in April by the Michigan Conservation Department and the U. S. Bureau of Sport Fisheries and Wildlife to kick off Michigan's first plantings for 1960 under the projected 10-year program to revitalize trout populations in the upper Great Lakes.

About 580,000 of the 1,260,000 yearling and fingerling lake trout slated for planting in Lakes Michigan and Superior during 1960 will come from Federal hatcheries in Michigan. Ontario will release another 470,600 lake trout while Wisconsin will stock the remaining 210,000.

In 1959, the State and Federal agencies pooled their resources, planting some 880,000 lake trout, to launch the rehabilitation program. The Great Lakes Fishery Commission has set an annual planting goal of 7 million yearling trout in Lakes Michigan, Huron, and Superior to restore populations which have been virtually wiped out by the sea lamprey.

This year's planting stock, consisting mainly of one-year-olds ranging from 5-6 inches, will be immune to the lamprey for several years after their release. By this time, it is expected that the predator will be under control.

The April plantings were made in the area of Fox, Trout, and South Fox islands in Lake Michigan with stock purchased by Illinois and reared at the U. S. Fish and Wildlife Service's Charlevoix Hatchery. An additional 37,000 fingerling lake trout from the hatchery will be liberated in Lake Michigan this fall as an experimental planting. Exact site of this release has not yet been determined.

Early in June, another 451,000 yearling lake trout will be set free in Lake Superior. This stock includes 292,000 trout reared at the Service's Pendills Creek hatchery from eggs collected in Crystal, Glen, Elk, Torch, and Higgins Lakes during the fall of 1958.

Of this total, 146,000 will be scatter-planted from docksides or the shore at several sites within Keweenaw Bay; the other half will be released in the Bay between Baraga and Pequaming Point. The other 159,000 yearlings, reared from brood stock at the Michigan Conservation Department's Marquette Hatchery, will be planted off Laughing Fish Point in Shelter Bay.

All stock will be marked with fin clips by personnel from the U. S. Bureau of

Commercial Fisheries for identification purposes.



## Great Lakes Fisheries Exploration and Gear Research

### SURVEYS OF COMMERCIAL FISH STOCKS IN LAKE ERIE TO BE OBTAINED IN 1960:

Explorations to determine the commercial potential of fish stocks in the United States waters of Lake Erie are to be continued in 1960. The U. S. Bureau of Commercial Fisheries chartered fishing vessel Active was scheduled to start exploratory fishing about May 16. Cruise 9, the first of the 1960 season, was to cover Lake Erie waters between Sandusky and Avon Point, Ohio. The vessel was scheduled to visit the ports of Huron, Vermilion, and Lorain to demonstrate gear techniques to commercial fishermen.



## Great Lakes Fishery Investigations

### LAKE ERIE FISH POPULATION RESEARCH INDICATES SHORTAGE OF ADULT YELLOW PIKE:

M/V "George L., April 1960: Field work in 1960 did not start until the ice went out in early April, according to a U. S. Bureau of Commercial Fisheries report on the Lake Erie Fishery Investigations. Unusually warm weather followed shortly thereafter and surface water temperatures rose from about 37° F. on April 13 to about 55° F. on April 28. Trawl catches indicated that most fish were in deeper waters.

Low commercial catches of large yellow pike in April strongly suggest a shortage of brood stock for spawning. This was expected, since only 37,000 pounds of yellow pike were taken in the Ohio commercial catches in the fall of 1959. The catch of yellow pike in the spring of 1960 is nearly certain to be a record low.

Many 9½- to 12-inch yellow pike were taken in trap nets in the Western Basin

in April. Approximately 4,000 of the fish were tagged in Ohio waters to determine the extent of movement to Canadian and other waters.

\* \* \* \* \*

#### PROGRAM OF THE RESEARCH VESSEL "CISCO" FOR 1960:

The possibility of an extensive trawl fishery for chubs in Lake Michigan in the very near future makes it imperative that an accurate estimate of the present chub population in the lake be obtained, since it will be highly desirable to know what changes, if any, the prospective trawl fishery will bring about.



Cisco, research vessel of the Service's Great Lakes Fisheries Investigations.

The chief aim of the U. S. Bureau of Commercial Fisheries research vessel Cisco during 1960 and 1961, accordingly, will be to establish a basis for future comparisons of Lake Michigan chub populations. The study will be conducted in the southern part of the lake in 1960 and the northern part in 1961.

An attempt will be made to determine the present populations by use of both gill nets and trawls. The intent is to standardize gear and techniques so that current and future data will yield reliable estimates of population changes. Gangs of nylon gill nets, which contain 9 mesh sizes from 1 to 4 inches, stretched measure, were hung by the Cisco's crew in the interest of standardization. The standard trawl will be a commercial type now used by Lake Michigan chub fishermen.

In 1960 the nylon gill nets will be set periodically at 25 and 50 fathoms off Grand Haven and St. Joseph, Mich., and Racine, Wis., and at 80 fathoms in mid-

lake between Grand Haven and Racine. The trawls will be towed at various depths off these same ports and off Milwaukee, Wis., at regular time intervals. Emphasis will, of course, be on chubs, but data for other species will also be collected.

A second objective will be to compare present chub populations with those of 1954-55. The identical linen gill nets (several mesh sizes,  $2\frac{3}{8}$ -3 inches) which were set by the Cisco in 1954 off Grand Haven, Mich., will be set in the same manner in 1960 off Grand Haven.

Another objective during 1960 will be to study the relationship of gill-net catches with the length of time set, as applied to chubs. This problem is, of course, complicated, probably related to abundance, species, and other variables, but any information at all would aid in analyzing gill-net catches.

Lack of time will limit limnological investigations to routine collections and observations, and perhaps a few brief special studies. The 11 cruises planned for the Cisco in 1960 will start on April 26, and end about December 6.

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#### RESEARCH VESSEL "SISCOMET" PROGRAM FOR 1960:

During 1960 the U. S. Bureau of Commercial Fisheries research vessel Siscomet will conduct its operations in western Lake Superior, with the exception of the Isle Royale survey. Attention will be devoted primarily to the study of the bathymetric distribution of fish stocks by fishing standard gangs of experimental gill nets (mesh sizes 1" to 5" by  $\frac{1}{2}$ " intervals) at depths ranging from 10 to 70 fathoms.

Long-term observations of environmental conditions and fish populations will be continued. Measurements will be made at index stations established in 1958.

Surveys will also be devoted to (1) the study of chubs (*Leucichthys* sp.) and lake trout in the Isle Royale region and along the Canadian north shore; (2) the spawning grounds of the lake trout and whitefish in the Apostle Island area; and (3) the collection of chub eggs and new

methods of trawling to sample stocks of spawning lake herring.



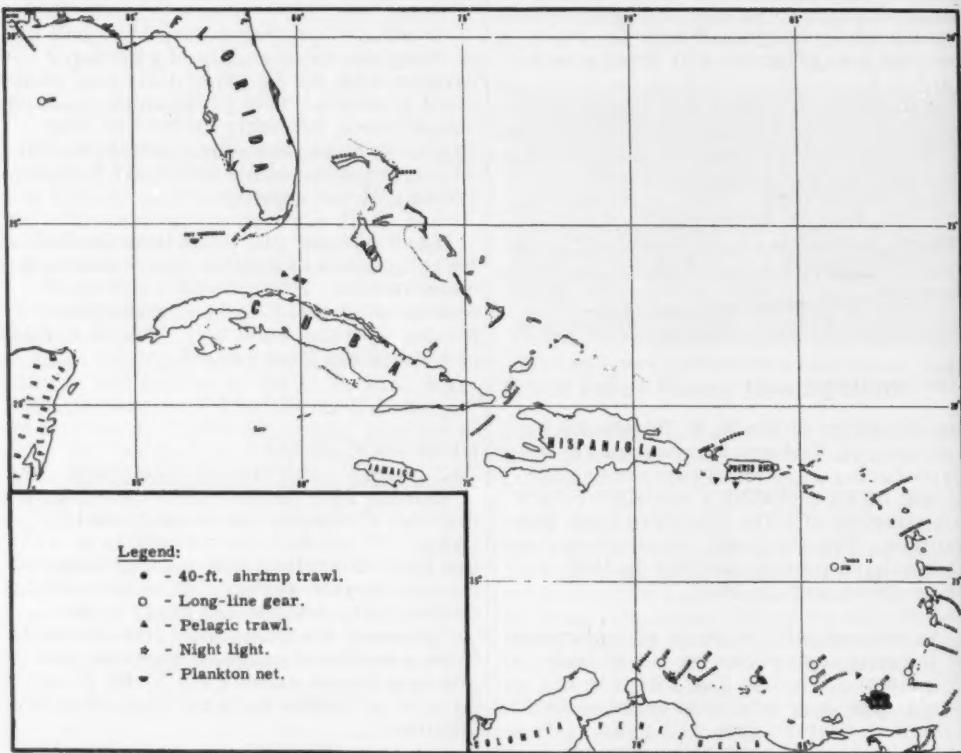
### Gulf Exploratory Fishery Program

**TUNA DISTRIBUTION IN SOUTH-EASTERN CARIBBEAN SEA AND OCCURRENCE OF ROYAL-RED SHRIMP OFF TRINIDAD EXPLORED:**

**M/V "Oregon" Cruise 66 (March 30-May 4, 1960):** The objectives of the

Table 1 - Tuna Catch by Station (M/V Oregon Cruise 66)

Sta. No.	Yellowfin	Bluefin	Albacore	Blackfin	Skipjack
2764	-	-	-	2	-
2765	3	-	-	2	-
2766	7	-	-	4	-
2767	-	-	-	-	-
2768	8	-	-	-	-
2769	3	-	-	1	-
2783	10	-	-	-	-
2785	11	-	-	1	-
2786	3	-	-	-	-
2790	2	-	-	-	-
2791	1	5	2	2	3
2792	-	-	-	-	-
2796	3	9	-	-	-
Total	51	14	12	2	5



M/V Oregon Cruise 66 (March 30-May 4, 1960).

cruise were to determine species, distribution, and availability to long-line gear of pelagic tunas and other large pelagic fish in the southeastern Caribbean Sea and eastern Gulf of Mexico. Besides the U. S. Bureau of Commercial Fisheries exploratory personnel, biologists from the Woods Hole Oceanographic Institute and the American Museum of

Natural History also participated in the 36-day cruise to tag tuna and marlin and to obtain biological data on the tunas and other large pelagic fishes. Another objective was to further the Bureau's studies on the distribution of the deep-water royal-red shrimp between  $61^{\circ}$  and  $66^{\circ}$  west longitude.

During the cruise 13 long-line sets, averaging 50 baskets per set, were made (see cruise chart and tables 1 and 2). Twelve

Maru, 3 exploratory tangle-net vessels, and 8 "Kawasaki"-type fishing vessels. The Russian fleet was fishing tangle nets and was made up of the mothership Vsevolod Sibirzev No. 24, at least 2 exploratory tangle-net vessels, and 10 to 12 "Kawasaki"-type boats.

In view of the magnitude of fishing effort and the difference in fishing methods, gear conflicts occasionally occur. This is particularly true in the early spring due to the constricting influence on the fishing area by ice. Secondly, king crabs

Table 2 - Long-line Catch by Species (M/V Oregon Cruise 66)			
Species	Total No.	No. Tagged	Weight (Lbs.)
Bluefin (Caribbean)	5	0	2,185
Bluefin (Gulf)	9	0	4,000
Total	14	0	6,185
Yellowfin (Caribbean)	48	12	5,745
Yellowfin (Gulf)	3	0	450
Total	51	12	6,195
Albacore (Caribbean)	12	1	563
Blackfin "	2	0	28
Skipjack "	5	0	105
Blue marlin "	6	1	1,250
White marlin "	8	0	680
Sailfish "	2	0	125
Spearfish "	2	0	121
Dolphin "	8	0	165
Rainbow runner "	1	0	8
Lancetfish "	2	0	13
Barracuda "	3	0	39
Sharks "	46	0	6,925
Sharks (Gulf)	10	0	1,550
Total	107	2	11,572
Grand Total	172	14	23,952

yellowfin tuna, one albacore, and one blue marlin were dart-tagged and released. Stomach content analysis, sex determination, and spawning condition and morphometric data were obtained from the remainder of the catch. Plankton tows and pelagic fish trawl tows were made in widely scattered areas.

Thirteen exploratory drags were made northwest of Trinidad in 160-290 fathoms, using a 40-foot two-seam shrimp trawl. Generally poor trawling bottom was encountered in the area, which prohibited long drags. Penaeopsu megalops and royal-red shrimp, Hymenopenaeus robustus, were encountered in small numbers throughout the depths covered. The largest catch contained 40 pounds of megalops and 10 pounds of robustus from a 50-minute drag.



### King Crab

#### EASTERN BERING SEA OPERATIONS:

In April 1960, the eastern Bering Sea king crab stocks were being exploited by fishermen from three countries. United States fishermen with 7 fishing vessels were taking crabs by otter trawling. Also, the Japanese fleet was fishing with the mothership Tokei



King Crab

are not uniformly distributed, but occur in relatively few areas of concentration.

Since 1954, Japanese and United States fishermen have marked their fishing areas by buoys and daily they inform each other by radio contact of their area of operations. This procedure has worked out very well and no conflicts have occurred over fishing grounds. By agreement, no buoys are placed within five miles of the fishing grounds being occupied. The Japanese and United States fishermen hope to make such an agreement with Soviet fishermen operating in that area.

#### TAGS RETURNED BY U. S. S. R.:

The U. S. Bureau of Commercial Fisheries king crab investigations received 34 tags with recovery information from the Soviet Union. The recoveries were made by the Russian king crab fishing vessels between July 17 and September 12, 1959, and included tags released by the Bureau biologists in 1957, 1958, and 1959.

The positions from which these recoveries were made are of particular interest. They indicate that the Russian king crab fishery was centered approximately 120 miles due north of Unimak Pass. It is an area in which the Bureau's surveys have annually shown an abun-

dance of new-shell crabs. It has not been fished by the Japanese commercial fishery and in past years was a major fishing area for United States fishermen during the autumn months.



### Maine Sardines

#### CANNED STOCKS, APRIL 1, 1960:

Distributors' stocks of Maine sardines totaled 252,000 actual cases on April 1, 1960--2,000 cases less than the 254,000 cases on hand April 1, 1959, according to estimates made by the U. S. Bureau of the Census.

Canners' stocks on April 1, 1960, totaled 397,000 standards cases (100 3 $\frac{1}{4}$ -oz. cans), a decrease of 77,000 cases (16.0 percent) as compared with April 1, 1959.

Table 1 - Canned Maine Sardines--Wholesale Distributors' and Canners' Stocks, April 1, 1960, With Comparisons <sup>1</sup>										
Type	Unit	1959/60 Season			1958/59 Season					
		4/1/60	1/1/60	11/1/59	7/1/59	6/1/59	4/1/59	1/1/59	11/1/58	
Distributors . . . . .	1,000 actual cases	252	235	296	176	197	254	268	312	
Canners . . . . .	1,000 std. cases <sup>2</sup>	397	843	1,001	422	272	474	891	1,037	

<sup>1</sup>/ Table represents marketing season from November 1-October 31.  
<sup>2</sup>/ 100 3 $\frac{1}{4}$ -oz. cans equal one standard case.

Note: See Commercial Fisheries Review, March 1960 p. 22. Correction in Table 1 the season heading "1957/58 Season" should read "1958/59 Season."

The 1959 pack (from the season which opened on April 15, 1959, and ended on December 1, 1959) was 1,753,000 standard cases, compared with 2,100,000 cases packed in the 1958 season. The 1960 fishery was legally open on April 15, but the canneries remained closed due to lack of fish.

The total supply (pack plus carryover on April 15, 1959) available during the 1959/60 season at the canners' level totaled 2,171,000 standard cases as compared to 2,434,000 cases the previous season. This was due to the decline in the amount packed in 1959/60. Canners' shipments from April 15, 1959, to April 1, 1960, amounted to 1,774,000 cases as compared to 1,960,000 cases for the same period a year earlier.



### Michigan

#### COMMERCIAL FISHERMEN PROPOSE CHANGES IN FISHING REGULATIONS:

The commercial fishermen of Michigan appeared before the State's Conservation Commission in April 1960 and made an urgent appeal for quick adoption of their proposed liberal changes in regulations.

They told the Commission, which was given power to regulate Michigan's commercial fishing industry March 19, 1960, that the changes were necessary to save their businesses and put them on better competing terms with operators from other Great Lakes states.

Keynoting their appeal was a request for permission to use the otter trawl, a type of fishing gear new to Michigan's commercial fisheries.

The Great Lakes area Regional Director of the U. S. Bureau of Commercial Fisheries said it is very difficult for gill-net operators to make a living in Lake Michigan. He qualified this by saying present equipment is outdated because it was primarily designed for catching fish that have virtually disappeared.

The Bureau's Regional Director pointed out that there still is good potential in the lakes for commercial fishermen and although trawling is an expensive operation, it is the only answer to saving the industry. He assured that trawling would not deplete game species because it allows for selective fishing.

The head of the Bureau's sea lamprey control program warned that the lamprey is now wasting the portion of chub populations which should be harvested by commercial opera-

tors. He remarked there is no biological reason for protecting these populations in deep waters, adding that the otter trawl provides a more efficient means of harvesting these stocks.

Trawl operators in other Great Lakes states are reportedly finding a ready market for small chubs and other non-commercial fish from companies producing pet food and fertilizer.

The President of the Michigan Fish Producers Association and spokesman for one group of fishermen, requested 10 changes in regulations. He proposed that the mesh size of chub nets be reduced by one-sixteenth of an inch and recommended lowering the size limit for yellow perch in a triangular area of Green Bay to match Wisconsin's 8-inch minimum.

Some of his other recommendations called for revising the season on yellow pickerel in Saginaw Bay to conform with the one in Lake Huron; switching the closed season on whitefish to November 1-December 10; extending the area where trap nets may be used for taking whitefish in Lake Huron; removing the closed season on calico bass; and matching sport and commercial perch fishing seasons in Lake Michigan.

Michigan's Department of Conservation officials told the fishermen that legal steps required by the Administrative Procedures Act in enacting legislative changes generally take about 90 days. Before action was taken on the above proposals, Department officials scheduled 10 meetings between May 3 and May 23 with commercial fishermen throughout the state to discuss problems.

\* \* \* \* \*

### COMMERCIAL FISHERMEN'S PROBLEMS DISCUSSED AT MEETINGS:

Michigan's commercial fishermen had an opportunity to present their problems and offer possible solutions to Conservation Department officials during a series of 10 meetings held throughout the State from May 3 through May 26, 1960.

From the meetings Department officials hoped to get the consensus of operators, which will lay the groundwork to managing the State's commercial fishing industry on a closer and more profitable basis than in recent years.

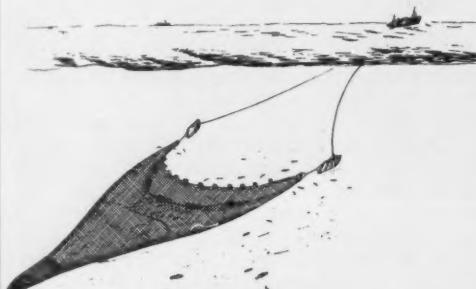
Regulation of this industry, involving about 1,000 licensed operators and some 39,000 square miles of Great Lakes waters, became the Conservation Commission's responsibility on March 19, 1960. Administrative duties have been assumed by the Department.

Under its new authority, the Commission is empowered to adjust regulations, pending legislative approval, with the exception of license fees and penalties. Regulations in effect before the transfer of authority have remained unchanged.

\* \* \* \* \*

### USE OF TRAWLS IN GREAT LAKES PROPOSED:

A proposed change in commercial fishing regulations to permit the use of



Atlantic otter trawler.

trawls in Michigan waters of the Great Lakes was discussed before the Conservation Commission during a special public hearing held on May 12, 1960, at the Higgins Lake Conservation School.

As proposed, the regulatory change would authorize the Conservation Department to issue permits for the use of trawls by commercial fishermen in taking chubs, herring, alewife, smelt, and other fish species it might designate. The Department would also regulate the kind and size of trawls, their mesh sizes, and the areas, time, and manner in which this new type, for the Great Lakes, of fishing gear could be used.

Permittees would be required to keep and submit records and reports of their trawling operations as required by the Department. Department authorities would be allowed to inspect these operations and check equipment, records, and fish catch.



### **Missouri**

#### COMMERCIAL FISHERIES LANDINGS, 1959:

In 1959, Missouri's commercial fishermen landed fish valued at \$85,000, lower by about \$10,000 than in 1958, a Missouri Conservation Commission fisheries biologist stated.

Fishermen on the Mississippi River landed 178,974 pounds of fish, those on the Missouri River landed 154,359 pounds and those on the St. Francis River landed 25,413 pounds.

Out of 1,076 persons who bought commercial fishing permits in 1959, only a few made it a full-time occupation. The high cost of equipment has caused the number of commercial fishermen to decline the past 15 years, while others were squeezed out of business when people refused to buy fish that tasted "oily" from pollution near the big cities.

"Actually there's a big demand for fresh river fish," the biologist said, "and the 358,746 pounds taken last year by commercial fishermen was only a small part of what was sold. Fish dealers import millions of pounds of marine and fresh-water fish yearly from outside Missouri to fill the demand."

Carp accounted for 41 percent of the catch, followed by buffalofish, flathead

catfish, drums, blue catfish, paddlefish, channel catfish, gar, sturgeon, suckers, bowfin, eels, and bullheads, in that order.



## National Fisheries Institute

### RESOLUTIONS ADOPTED AT 15TH ANNUAL CONVENTION:

At the National Fisheries Institute 15th Annual Convention in Miami Beach, April 29-May 4, nine resolutions were submitted and adopted by the Board of Directors on May 4, 1960.

**1. Voluntary Frozen Food Handling Practices.** That the Association of Food and Drug Officials of the United States be commended for its interest in the improvement in the handling of frozen foods; but that the Institute vigorously insists that improvement in frozen food handling methods can be accomplished better by cooperative industry action than by State, Federal, or Municipal Government statutory or regulatory actions; and that the Institute join with other segments of the frozen food industry in developing and adopting a uniform industry program of frozen food handling practices; and that the Institute through its members urge state legislators and agency officials to refrain from establishing arbitrary and unrealistic laws or regulations in the realm of quality improvement of frozen seafoods.

**2. N. F. I. to Participate in Joint Frozen Food Committee.** Whereas, it is desirable for the Institute to join with other segments of the frozen food industry in properly developing such a program; and whereas, members of the Institute and the staff have already constructively participated in preliminary joint industry meetings; it was resolved that the President be directed to appoint a committee of three members to direct and guide this program; and that said committee and the staff be given authority to represent the Institute in any joint industry committee and to participate in the development of the program; and that the Executive Committee be empowered to solicit voluntary contributions of such funds as may be required to carry out this resolution.

**3. Fresh-Fish Handling Research.** The Institute requests the U. S. Bureau of Commercial Fisheries to continue its technological investigations of fresh-fish handling methods and to initiate a comprehensive research on the relations of time and temperature to the losses of quality in each step in the handling of fish from the water to the consumer; and that the Institute's Technology Division staff be asked to carry out an active program of informing the fresh fish industry of quality-improving equipment and methods, through personal contacts and demonstrations, and through a monthly technical newsletter devoted specifically to fresh-fish handling matters, within budget limitations.

**4. Revise Frozen Fried Fish Sticks Standards.** The Institute requests the U. S. Bureau of Commercial Fisheries to study the advisability of revising the Standards for Grades of Frozen Fried Fish Sticks, and if the studies so indicate, to endeavor through research and frequent consultation with industry to develop an acceptable practical set of proposed revised Standards.

**5. Authorizes Institute's Technology Division to accept specially contributed funds and regularly budgeted money, and to expend these in accordance with the contributing groups' instructions and within the Institute's regular operating limitations.**

**6. Authorizes Institute's Technology Staff members to participate in Atlantic and Pacific Fisheries Technological Conferences.**

**7. Recommend Standards of Identity for Breaded Shrimp.** Whereas, the breaded shrimp industry has for two years considered the desirability of establishing Standards of Identity for Breaded Shrimp in order to prevent the possibilities of unfair competition from excessively breaded products; and whereas, the breaded shrimp industry has developed a set of possible standards which it plans to submit to the Food and Drug Administration for the latter's approval and official establishment; the Institute commends the breaded

shrimp industry for this action and urges the Food and Drug Administration to adopt the industry's proposed standard of identity for breaded shrimp.

**8. Retention of Fisheries Exemption for Truck Transportation.** The Institute reaffirms its support of the exemption from I.C.C. regulation of motor vehicles transporting fresh and frozen fishery products in interstate and foreign commerce.

**9. Regulated Motor Carriers to Publish Reasonable Rates and be Liable for Damages.** Whereas, Senate bill S. 3389 has been introduced in the 86th Congress of the U. S. requiring motor carriers to publish just and reasonable rates and making them liable for the payment of damages and reparation for failure to do so; and whereas, the fishery industry is in favor of the provisions of this legislation; the Institute supports the passage of S. 3389 or similar legislation which may be introduced in the future.



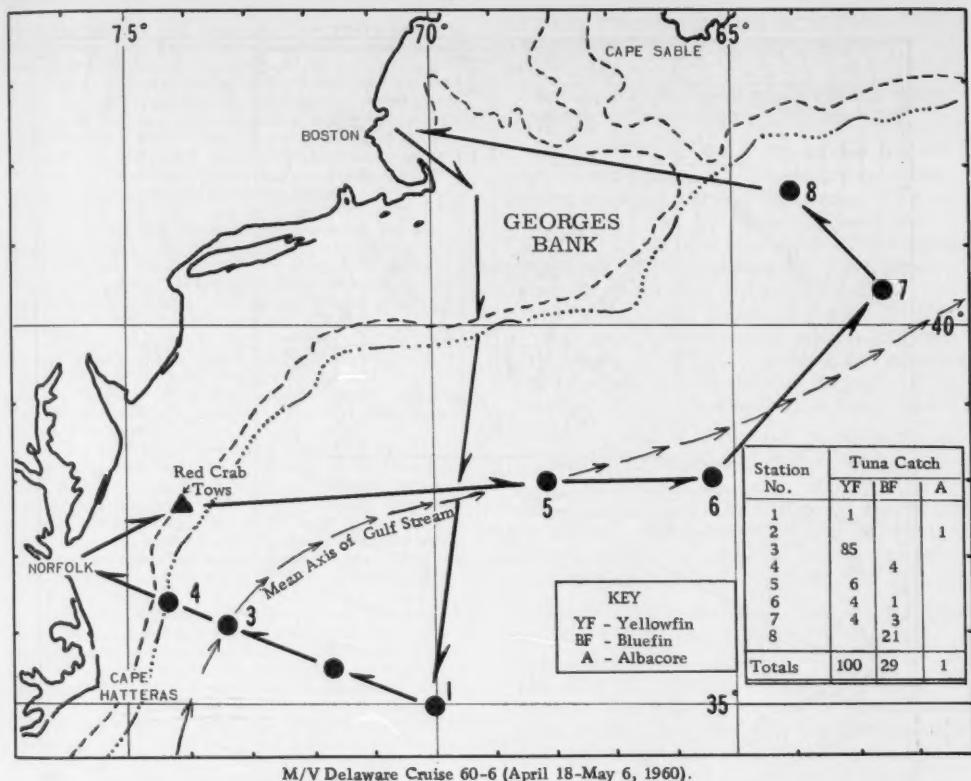
## North Atlantic Fisheries Exploration and Gear Research

### AREA BETWEEN GEORGES BANK AND CAPE HATTERAS EXPLORED FOR TUNA STOCKS:

M/V "Delaware" Cruise 60-6: Tuna were landed at each of eight long-line stations completed by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Delaware during an April 18-May 7 cruise. Three species--bluefin (*Thunnus thynnus*), yellowfin (*Thunnus albacares*), and albacore (*Thunnus alalunga*)--were present in the catch taken from the waters between Cape Hatteras and Georges Bank.

During the cruise, a variety of hydrographic conditions were encountered, with surface temperatures at long-line fishing locations ranging from  $43.6^{\circ}$  to  $77.1^{\circ}$  F. Some of the fishing stations were either in, or directly adjacent to, the axis of the Gulf Stream. Catches at the stations with high water temperatures were predominantly yellowfin, while catches at locations with colder water were bluefin; intermediate locations produced mixed catches of both species.

The most productive station was located in the Gulf Stream Track at  $73^{\circ}25'$  W. longitude and  $36^{\circ}07'$  N. latitude, and yielded 85 yellowfin on a 60-basket set (600 hooks). The estimated weight of the fish caught at that station ranged from 70 to 90 pounds each. Water temperature at the surface was  $77.1^{\circ}$  F.



In addition to the information gathered on the distribution of certain of the tunas in the Western North Atlantic, biological and other data were collected by representatives of the Woods Hole Oceanographic Institution and Boston University. Forty-two tunas were marked and released, using plastic "spaghetti" tags.

During the cruise, two trawl stations were completed, in depths of 215 to 325 fathoms off Ocean City, Md. The objective of these tows was to collect a sample of the deep-sea red crab (*Geryon* sp.) for testing by the Bureau's Technological Laboratory in Gloucester. A total of three hours of trawling with a No. 36 trawl produced about 500 pounds of red crabs; these were cooked and frozen aboard the Delaware. In addition to the red crab catch, one of the tows yielded 21 American lobsters (*Homarus americanus*) which averaged six pounds each. Fish in these tows included several spe-

cies of hakes, some of which were preserved for study.

Note: Also see Commercial Fisheries Review, July 1959 p. 40.

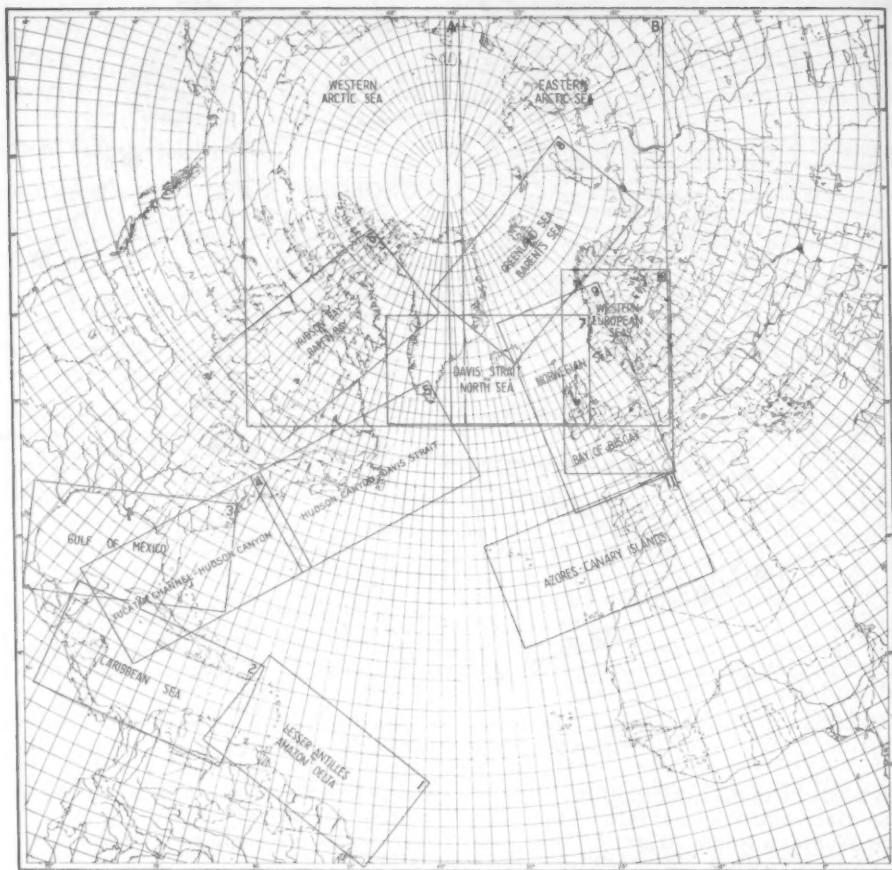


## Oceanography

### ATLANTIC OCEAN ATLAS BEGUN:

To chart the possibility of farming and mining the oceans for new sources of food, fuel, and minerals, the American Geographical Society has begun work on a comprehensive atlas of the North Atlantic Ocean. It is expected to provide scientists with a new research tool for making comparative studies of the interrelationships of marine organisms and their environments.

The project is aimed at integrating vast amounts of data, published and unpublished, now accumulating at a rapid rate. Physical oceanographers, marine biologists, geologists, physicists, and other specialists will be invited to contribute to the new atlas. They will be asked to plot their own original data on base maps specially prepared by the Society as work sheets. Where necessary, explanatory texts will supplement the maps, which



will be published individually in a continuing series as soon as they are completed.

The maps will be printed in two versions: one on paper, for general distribution; the other, a limited edition on transparent material, to facilitate comparative studies in research laboratories.

The biogeographical atlas will show as many of the variables of the ocean as possible. Embracing the North Atlantic from top to bottom and from the equator to the pole, it will show the distribution and productivity of plants and animals, bathymetry, bottom sediments, properties of water masses, courses of currents, seasonal changes in temperature, movement of water, direction and force of winds, air temperature, and solar radiation. The project is long-term in character and scientists expect substantial results by 1970.

Cooperating research organizations include the Atlantic Fishery Oceanographic Research Laboratory (U. S. Bureau of Commercial Fisheries), Woods Hole Oceanographic Institution, and the Royal Soci-

ety of Canada. Other scientific bodies and individual scientists on both sides of the Atlantic are being invited to cooperate in the atlas program. The American Geographical Society is serving as general coordinator and publisher.

The first maps to be published will be those of the continental shelf of eastern North America showing fishing activities and the distribution and biological productivity of plants and animals. Two sheets covering the eastern seaboard from the Labrador Sea to the Straits of Florida already have been completed.

The project is under the general auspices of the Committee on Oceanography of the National Academy of Sciences - National Research Council.

The Committee last year set up a Panel on North Atlantic Biogeography to investigate the feasibility of the present project. In a statement to the scientific press, one panel member said: "It happens often in marine research, as elsewhere, that correlations are found which seem significant, only to

have the pattern fall apart in a few years owing to the unsuspected existence of variables which had not been included in the original investigation. Plotting the distribution of as many variables as possible will offer a broader approach to these problems, and will uncover sensitive areas into which new research effort may be put." He said the new atlas would also offer means of publishing material which might not appear in print because of prior demands on research facilities.

It is hoped that most of the financing for the program will come from industry and foundations. Contributions totaling \$17,000 already have been made. A total of \$42,000 is being sought for the preliminary phase of operations. Cost of the project as a whole is estimated at \$500,000.

In Canada, the program is being sponsored by the Canadian National Research Council. European countries are being approached through the International Commission for the Northwest Atlantic Fisheries.

In describing the plan of operation, Dr. Hitchcock said that the completed work sheets returned to the panel by scientists would be evaluated. Once accepted, the materials would be sent to the Society, whose cartographers and technicians would study the best means of graphic presentation. Printing and distribution will be in charge of the Society.

The maps will necessarily vary in scale and in area covered, from a small section of the coast to an entire ocean, but they will all be based on a single oblique stereographic projection so computed that half-degree intersections of parallels of latitudes and meridians of longitude can be accurately plotted on whatever scale is chosen for an individual map.

Thus complete cartographic continuity for the whole area will be provided, and this continuity, valuable in itself, will solve the problem of joining adjacent sheets. It will also facilitate the reduction of large-scale compilations to smaller scales for such purposes as integrating and summarizing important results and conclusions.

The stereographic projection has the property of conformality (directions around points are shown correctly), which is important in plotting movement, as for example, flow lines of currents and migrations of fishes. Though precise measures of distances and areas cannot be recovered directly from a conformal map, simple procedures are available for obtaining these measures with sufficient approximation. In case such measurements are required, we plan to issue short instructions with the base charts.

While excellent marine atlases exist--principally in Russia, the Netherlands, Great Britain, France, and Japan--these do not serve the research needs envisioned. They are generally based on outdated published information, are too limited in scope, too generalized, and of too small a scale to be useful "for the purposes of integrating advanced research relating to marine environments and the problems of biogeography."

\* \* \* \*

### EXPEDITIONS BY THE SCRIPPS INSTITUTE OF OCEANOGRAPHY FOR 1960:

Scripps Institution of Oceanography expeditions planned in 1960 include:

**Tethys Expedition:** To cross the Equator and travel to five degrees south before making port in Honolulu. The expedition has two principal objectives. The first is to take samples of the small creatures of the oceans that live at a depth of about two miles. The distribution of these will be compared with that of near-surface animals, which are better known. In addition, geological studies will be conducted south of Hawaii. The expedition left its California home port in May.

**Limbo Expedition.** Takes the research vessel Horizon to a point about halfway between California and Hawaii to remain for several weeks measuring currents in waters three miles deep. This vessel also sailed in May.

**Monsoon Expedition:** Will use a 1,900-ton Navy ARS which is being reconditioned for oceanographic exploration. The ship will sail in August to cross the Pacific and Indian Oceans to Mauritius. After Mauritius she will visit Indonesia and Australia before returning to San Diego. The chief purposes of the trip are sediment studies in tropical waters and geological-geophysical investigations in the Indian Ocean. The Indian Ocean work is part of an International oceanographic investigation of the area.

For three months, starting September 15, the R/V Horizon will engage in studies of the Peru Current, traveling as far south as northern Chile.

\* \* \* \*

### LINK ADDED TO UNDERWATER MOUNTAIN CHAIN IN GULF OF ALASKA:

A Coast and Geodetic Survey ship detected an unusual hump on the ocean floor in the Gulf of Alaska this year. The unusual hump turned out to be an 8,700-foot seamount or underwater mountain.

The discovery, announced on May 20, 1960, by the Director of the Coast and Geodetic Survey, U. S. Department of

Commerce, was first reported by the Captain of the Survey Ship Pathfinder after deliberately sailing her through an uncharted spot in a chain of charted underwater mountains marking an ancient fissure on the ocean floor.

When the sweep of the echo-sounder revealed the telltale rise in the ocean floor, the Pathfinder reversed her course and criss-crossed the area in question. After further processing of the soundings, hydrographers had an almost complete picture of the seamount which is a flat-topped cone that measures 12 miles in diameter at the base,  $1\frac{1}{4}$  miles across the top, and 8,700 feet high. The almost perfect flat top, which is 3,984 feet under water, is marred by a slight peak in the center.

Although other seamounts of more than two miles high have been found in this region, the new discovery, located 56 degrees north latitude and 143.2 degrees west longitude, forms a significant link in a chain stretching southeastward across the Gulf of Alaska from Kodiak Island toward Vancouver Island. This is the 20th one to be located in the 600-mile chain, which begins on the floor of the Aleutian Trench 100 miles east of Kodiak Island, and it lies about one-third of the distance from Kodiak to Vancouver.

The new seamount is approximately the 160th discovered in this extensive Northeast Pacific region by the Coast and Geodetic Survey ships on their spring and fall trips to and from coastal survey areas in western and northern Alaska, the Aleutians, and in Bering Sea waters.

In addition to the seamount information, the deep-sea sounding lines provide a continuous track of soundings which are the basis of the Gulf of Alaska Nautical Chart No. 8500, originally published in 1952. The current issue of the chart includes numerous seamounts discovered and surveyed in detail to date.

Of interest are two falsely reported seamounts in the area of this chart, one of which was said to have been the cause of a serious shipwreck. When the Washington Mail broke in half in rough seas on March 3, 1956, 300 miles southeast of Kodiak Island, it was claimed that a sea-

mount caused the wreck. Pursuant to this claim the Coast and Geodetic Survey ship Pathfinder sounded a 1,000-square mile area at the reported position, but found no depths less than two miles deep.

Another pseudo seamount was reported to rise  $1\frac{1}{2}$  miles to a depth of 70 feet, 75 miles off Vancouver Island, but repeated sounding over a large area indicates that the original reporting may have been caused by acoustic sounding-echoes from the back of a whale.

Although considerable exploration has been accomplished in this vast region of one million square miles, a great amount of surveying and oceanographic exploration is required to fully disclose the nature of this ocean floor so closely related to the continental United States.



### Salmon

#### NEW SALMON FISH HATCHERY UNDER CONSTRUCTION IN STATE OF WASHINGTON:

Construction of a new salmon hatchery on Grays River, Pacific County, Wash., was announced by the Governor on May 5, 1960. The hatchery, with an annual fry capacity of around 7 million salmon and a rearing capacity of 5 million, will be the 22nd in the state's system of salmon hatcheries and the 5th built by Federal funds under the Lower Columbia River Development Program, the Governor said. Cost of construction will be over \$500,000.

Plans and specifications for the new hatchery, which were due to be completed on May 6 by the engineering section of the Washington State Department of Fisheries, were sent to Portland, Ore., for approval by the U. S. Fish and Wildlife Service, and finally to the Service's head office in Washington, D. C.

The job will include construction of a hatchery building, 100 by 40 feet, 10 outdoor concrete ponds, a large earthen pond, and two holding ponds for ripening salmon. A fish ladder, racks, and trap will be included for the holding ponds. In addition, a new timber bridge for access to the hatchery site will be constructed to

replace the present bridge. Water for the hatchery will be taken from the river with a gravity water supply system.

The hatchery will be used for the rearing of chinook, silver, and chum salmon, with special emphasis on the short-term rearing of chinook and chum.

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#### WASHINGTON AND OREGON COOPERATE IN SALMON TAGGING PROGRAM:

Salmon were tagged in the Possession Point area in Puget Sound in April by the Washington State Department of Fisheries, marking the third salmon research project carried out by the Department in March and April.

The Possession Point project includes a testing of the effects of single and treble hooks on young salmon. Salmon are caught on sports fishing gear and tagged under the dorsal fin with orange spaghetti-type tags. Recoveries will indicate which type of hook causes the most damage to the fish in addition to adding knowledge of migration patterns.

An offshore troll salmon tagging project was conducted off the coast south of Westport, Wash., from March 15 through April 9. Chinook salmon were tagged in an effort to establish migration patterns and the origin of chinook in the ocean area from North Head north to Grays Harbor. A total of 149 chinook was captured and tagged. Approximately 10 fish were taken each day of fishing. A similar project in 1959 averaged 8 fish per day. During March, best fishing was in the North Head-Willapa Bay area; in early April, fishing picked up slightly in the Westport area. Less than 25 percent of the chinook caught in the 1960 test were under the minimum legal size of 26 inches.

The Oregon Fish Commission also conducted an offshore troll tagging project in conjunction with the Washington Department of Fisheries. The Oregon project resulted in the tagging of 194 chinook. Both investigations included the use of barbed and barbless hooks and preliminary results indicated very little difference in catchability between the two.

The third project conducted by the Washington fisheries agency was a test-fishing investigation on chinook salmon in the Corbett drift area of the Columbia River, in an effort to determine timing of the spring chinook salmon run in the Columbia. This project closed on April 29, just prior to the opening of the spring Columbia River commercial chinook salmon fishing season.

The Columbia River test fishing project was also in conjunction with one conducted by the Oregon Fish Commission in Woody Island area where the fish caught in good condition were tagged and released. The biologists found that it takes approximately 12 days for a chinook salmon to move upstream to the Corbett area from the Woody Island area, a distance of approximately 65 miles.



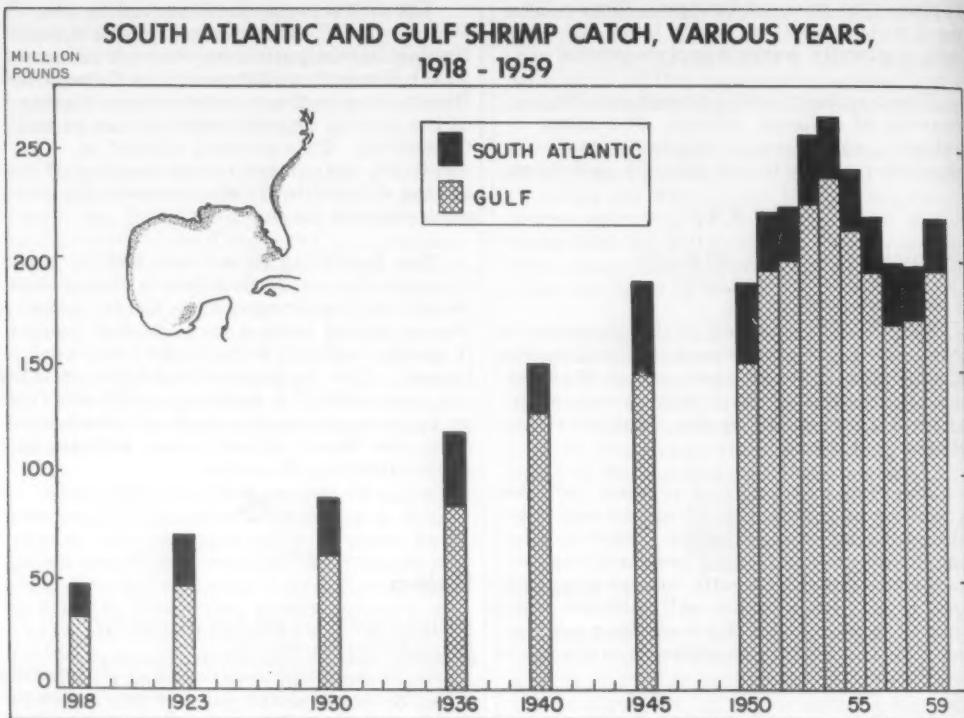
#### Shrimp

##### INDUSTRY CONFRONTED WITH PRODUCTION PROBLEMS:

An increasing number of craft sharing a fairly stable domestic shrimp resource and increasing domestic competition from shrimp fisheries developing in many parts of the world are among the problems facing the United States shrimp industry, according to a report issued by the U. S. Bureau of Commercial Fisheries.

The report was prepared in accordance with a provision of the Fish and Wildlife Act of 1956. This provision authorizes the Secretary of the Interior to make a report--when requested--with respect to any fishery product imported into the United States; to determine whether there have been any downward trends in prices, production, or employment; and to determine whether there has been an increase in imports of that product. The request was made by the National Shrimp Congress, Inc., an organization whose members produce more than 70 percent of United States-caught shrimp.

In releasing the report, Under Secretary Elmer F. Bennett said that it is not purported to be a complete economic



study of the shrimp fishery. "It would have been desirable to have made a more thorough economic study of the industry, but neither time nor resources would permit such detailed effort," he said.

"Accurately projecting the course of world production and expansion of exports of shrimp by foreign nations will require more information than is available in this report," Bennett said. "For these reasons any policy decisions of this Department, particularly with respect to tariff policy, should be based upon additional data and more complete analysis."

The report shows that in recent years there has been an increase in the number of shrimp boats, but no change in production other than the normal annual fluctuations in the resource; there has been a decrease in the gross earnings per boat; the discovery of new shrimp areas has resulted in the construction of more seaworthy larger vessels; in-

creased construction costs are noted; employment has increased at a greater rate than the increase in the number of vessels, mainly because the larger vessels require larger crews; and there has been a substantial increase in the amount of shrimp imported into the country.

One of the significant things noted in the report is that until the price to the shrimp fisherman dropped in 1959 there had been sufficient increase in prices to more or less balance off the decreasing catch per boat. Also, price decreases, boatside, before 1959 had been followed quickly by price increases which tended to stabilize the fishery. The 1959 slump presents a different picture and, the report says, "the effectiveness of the United States shrimp industry in coping with the present situation appears to be reduced."

In 1959 the average gross return for shrimp landings in the Gulf of Mexico and in the South Atlantic areas was \$7,500

per shrimp trawler, lower than any year since 1950 when it was \$6,400. The average annual catch for 1959 was 17,300 pounds (heads-off weight) per vessel. This was considered low, although it was 1,300 pounds more than the 1958 average. In 1953 the catch per trawler averaged 23,600 pounds.

During the past 10 years the shrimp otter-trawl fleet has increased by about 1,000 craft to a fleet of 7,610 in 1959. The increase was entirely in vessels of five tons net or over; the number of smaller craft of less than five net tons declined. More than 80 percent of the catch was taken by vessels of five net tons and over.

Employment in 1959 was estimated to have been slightly higher than in 1958 when it was 17,153, about 2,000 higher than in 1957. Comparable data for other years are not available.

In 1959 imports were at a record high of 106,555,000 pounds, an increase of 25 percent over the 1958 imports. The 1958 imports were 23 percent higher than those of 1957. In 1939 shrimp imports were four million pounds; in 1950 imports exceeded 40 million pounds and in 1955 shrimp imports approximated 54 million pounds.

Since 1948 the world production of shrimp, exclusive of mainland China, has increased nearly 80 percent, to reach an estimated 632 million pounds, heads-off weight. In 1950, 18 countries exported 40 million pounds of shrimp to the United States. Mexico supplied 99 percent of that. In 1959 there were 51 nations sending more than 106 million pounds of shrimp to the United States. Mexico led with 69 million pounds which represented 64 percent of the total.



### South Atlantic Exploratory Fishery Program

LARGE BEDS OF CALICO SCALLOPS  
FOUND OFF FLORIDA EAST COAST:  
M/V "Silver Bay" Cruise 23 (April 13  
to May 6, 1960): A large stock of calico

scallops (*Pecten gibbus*), occupying an extensive area, was discovered and tentatively delineated along the east coast of Florida near Cape Canaveral by the U. S. Bureau of Commercial Fisheries' chartered fishing vessel *Silver Bay* during an April 13 to May 6, 1960, exploratory cruise. Commercial concentrations were found over a 1,200-square-mile area with indications that the bed may be even more extensive.

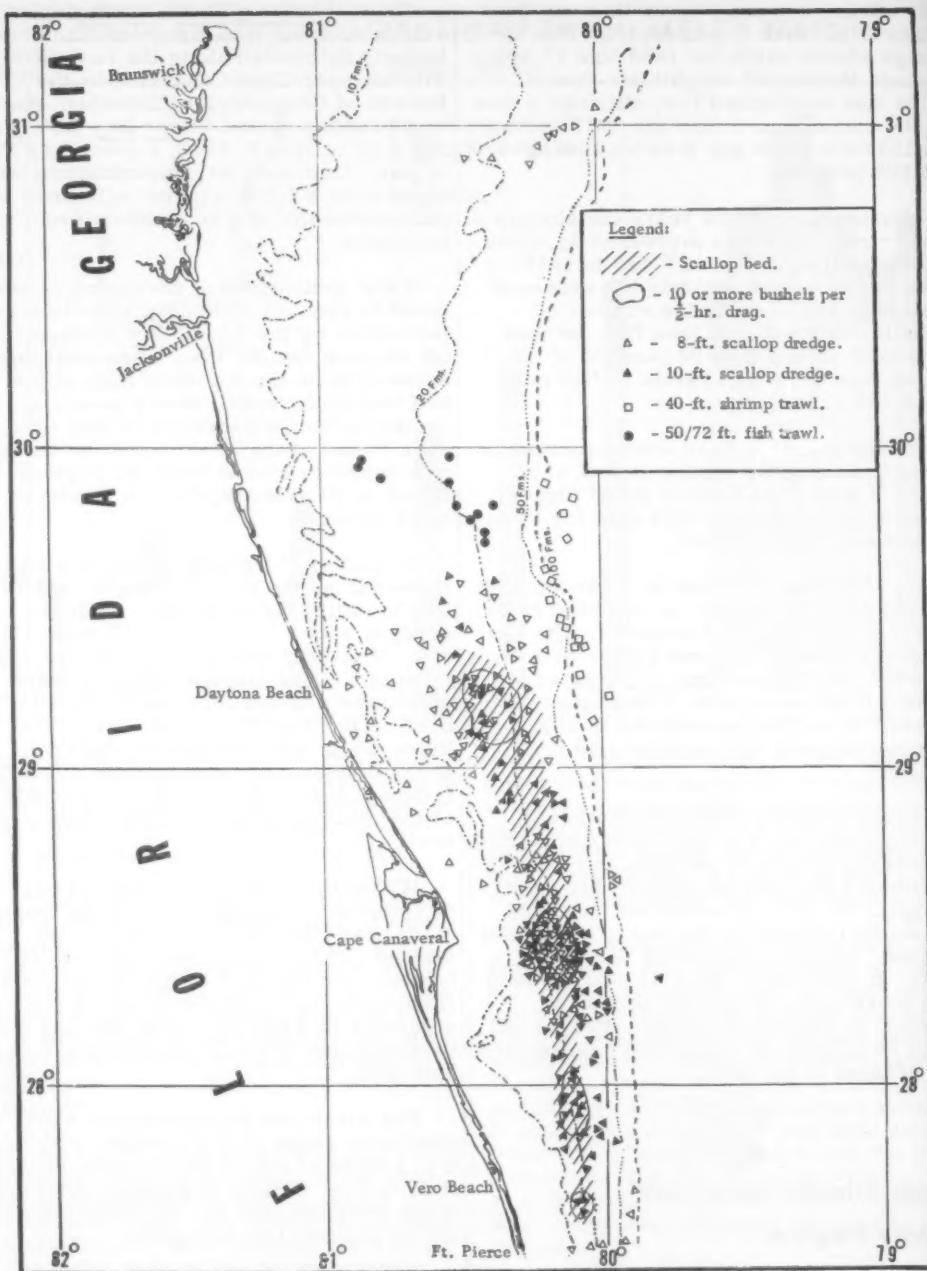
First indications of the resource were noted in January 1960 during routine explorations by the *Silver Bay* (Cruise 21) off Daytona Beach, Fla., when what now appears to be the northern edge of the bed was discovered. Heavy seas prevented further exploration at that time. As a result of the latest work the bed is now known to extend from off Daytona Beach to Ft. Pierce, Fla., in depths of 10 to 32 fathoms.

A total of 252 dredging stations was made during the cruise using 8- and 10-foot modified Georges Bank scallop dredges with 2" rings and 1½" mesh liners. A total of 177 drags within the confines of the bed yielded approximately 664 bushels of scallops (an average of 3¾ bushels per half-hour tow), and 126 of these drags were within the apparent areas of heaviest concentration (15 to 25 fathoms) and accounted for 659 bushels of the catch (average of 5.2 bushels per tow).

Within the most productive area (15-25 fathoms), 16 consecutive drags were made along the 20-fathom curve and yielded 135 bushels at rates of 1 to 13 bushels, averaging 8.5 bushels per day. Elsewhere the catch rates varied considerably on adjacent drags yielding from less than one to a high of 24 bushels per half hour.

The catch was predominantly within a shell size range of 2-2½ inches, yielding 4 to 5 pints of meats per 80-pound bushel. A 40-bushel sample of scallops of varying sizes were shucked for laboratory studies by Bureau Technologists.

Fifteen drags with a 41' head/47' foot rope, 1½" mesh, 2-seam shrimp trawl were made as a seasonal check on the royal-red shrimp potential off St. Augustine and

M/V Silver Bay Cruise 23 (April 12-May 6, 1960).

Daytona Beach. Catches up to 170 pounds (heads-on) per three hour drag were made in 180 to 230 fathoms between 29° 53' and 29° 09' north latitude.

Limited exploration on known snapper lumps off St. Augustine with a roller-rigged, 2-seam, 4½" mesh nylon fish trawl produced catches of mixed fish up to 1,500 pounds per 90-minute tow. Individual catches as high as 1,000 pounds of vermillion snappers (Rhomboplites aurorubens) and 345 pounds of porgies (Pagrus and Stenotomus) were made. No red snappers were taken.

*Note: Also see Commercial Fisheries Review, March 1960 p. 26.*

\* \* \* \* \*

#### USE OF COMMERCIAL SCALLOP DREDGES

##### DEMONSTRATED TO FISHERMEN:

During the week of May 30 to June 5 the Silver Bay conducted daily trips to the Cape Canaveral scallop bed off the Florida Atlantic Coast to demonstrate use of commercial scallop dredges to interested fishermen.

The M/V Silver Bay (Cruise 24) was scheduled to return to the Cape Canaveral, Fla., area during May 25-June 17 to conduct follow-up explorations and gear trials in the calico scallop bed discovered during cruise 23.



#### Tuna

##### UNITED STATES AND JAPANESE BIOLOGISTS COORDINATE RESEARCH ON ALBACORE SPAWNING AREAS:

The Director of the Hawaii Area and the Chief, Albacore Ecology Investigations, Honolulu Biological Laboratory, U. S. Bureau of Commercial Fisheries,

returned to Honolulu May 15, 1960, after spending a month conferring with various fishery officials and scientists throughout Japan.

Their trip was made primarily to plan an expedition to discover albacore spawning grounds, to be carried out this summer by the Bureau's research vessel Charles H. Gilbert and the Japanese Fishery Agency's vessel Shunyo Maru, attached to the Nankai Regional Fisheries Research Laboratory at Kochi, Japan. Biologists of the Honolulu Biological Laboratory and the Nankai Laboratory are both interested in learning the origin of this commercially-important Pacific-wide species of tuna. As a result of this trip, future research by Japanese and American tuna biologists will be more closely coordinated.



#### United States Consumption of Fishery Products, 1959

Fish is not keeping pace with the increased consumption trend for meats and poultry. There has been a sizable per capita consumption increase for meats and poultry, while fish and shellfish consumption is either barely holding its own, or declining.

Per capita meat consumption has increased steadily since 1935-39, with the exception of a decline in 1958 and a predicted minor decline in 1960.

Per capita poultry consumption has also shown a sharp increase since 1935-39, with a tendency toward stabilization since 1957. The greatest surge in consumption was during the 10-year period following 1947 when high volume production and a low selling price became the keynote of that industry.

Conversely, per capita fish and shellfish consumption reached its peak during 1935-39. But it dropped steadily from 1939 until 1958. In 1958 consumption recovered a little and the trend toward stability set in. Less canned and somewhat less cured fish were consumed in 1959 than during 1935-39, and fresh and frozen fish consumption increased only three-tenths of a pound (edible weight) per capita in the same period. The decrease in the consumption of canned fish was caused by a drop in the pack of canned salmon; also a shift in consumer preference from canned to frozen fillets and frozen packaged specialties like fish sticks and portions. Because cured fish is a more selective item and

Apparent Civilian Per Capita Consumption of Fish and Shellfish, Calendar Years, 1935-39 and 1947-49 Averages, 1957-59, and Preliminary for 1960, with Percentage Comparisons

Commodity	Average		Preliminary <sup>1/</sup>			1960 as a Percentage of			
	1935-39	1947-49	1957	1958	1959	1960	1935-39	1947-49	1959
Fish (edible weight) - Total . . . . .	11.0	10.5	10.1	10.7	10.7	10.6	96	101	99
Fresh and frozen . . . . .	5.4	6.0	5.6	5.9	5.9	NA	-	-	-
Canned 2/ . . . . .	4.9	3.9	3.9	4.2	4.2	NA	-	-	-
Cured . . . . .	0.7	0.6	0.6	0.6	0.6	NA	-	-	-

<sup>1/</sup> Excludes Hawaii and Alaska.

<sup>2/</sup> Excludes canned food products containing small quantities of fishery products, such as clam chowder, etc.

NA: not available.

more stable, there has been no significant change in per capita consumption since 1947.

On the whole, however, the picture is not bright for edible fishery products as the major competitive products appear to be getting an ever-increasing share of per capita consumption, and likewise the consumer dollar.



## U. S. Foreign Trade

### EDIBLE FISHERY PRODUCTS, MARCH 1960:

Imports of edible fresh, frozen, and processed fish and shellfish into the United States during March 1960 increased by 27.7 percent in quantity and 17.6 percent in value as compared with February 1960. The increase was due primarily to higher imports of groundfish and other fillets (up 1.5 million pounds), frozen albacore and other tuna (up 7.1 million pounds), and to a lesser degree, an increase in the imports of canned tuna in brine. The increase was partly offset by a 1.4-million-pound decrease in the imports of canned salmon.

Compared with March 1959, the imports in March this year were lower by 4.6 percent in quantity and 0.8 percent in value due to decreases in the imports of frozen tuna other than albacore (down 9.2 million pounds), and canned salmon (down 5.8 million pounds). Compensating, in part, for the decrease was an increase of about 6.3 million pounds in the import of frozen albacore tuna and groundfish and other fillets (up 1.6 million pounds).

Item	Quantity		Value	
	March 1960		Year 1959	
	(Millions of lbs.)	(Millions of \$)	(Millions of lbs.)	(Millions of \$)
<b>Imports:</b>				
Fish & shellfish: Fresh, frozen & processed <sup>1/</sup> . . .	80.2	84.1	1,070.5	24.1 24.3 309.6
<b>Exports:</b>				
Fish & shellfish: Processed only <sup>1/</sup> (excluding fresh & frozen) . . .	3.5	7.7	68.0	0.9 2.1 25.2

<sup>1/</sup> Includes pastes, sauces, clam chowder and juice, and other specialties.

United States exports of processed fish and shellfish in March 1960 were lower by 34.5 percent in quantity and 30.8 percent in value as compared with Feb-

ruary 1960. Compared with the same month in 1959, the exports this March were lower by 55.1 percent in quantity and 57.1 percent in value. The lower exports in March this year as compared with the same month in 1959 were due to the short supply of California sardines available for export to foreign countries.

\* \* \* \* \*

### IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA:

The quantity of tuna canned in brine which may be imported into the United States during the calendar year 1960 at the 12½-percent rate of duty is 53,448,330 pounds. Any imports in excess of the quota will be dutiable at 25 percent ad valorem.

Imports from January 1-April 30, 1960, amounted to 13,516,144 pounds, according to data compiled by the Bureau of Customs. From January 1-May 2, 1959, a total of 14,958,862 pounds had been imported.



### Wholesale Prices, May 1960

The over-all wholesale price index for edible fishery products (fresh frozen and canned) for May 1960 was 126.6 percent of the 1947-49 average, up 2.7 percent from the preceding month. This increase from April to May was due primarily to higher fresh haddock and fresh and frozen shrimp prices. From May a year ago to this May the index increased 4.0 percent due mainly to higher prices for shucked oysters, frozen shrimp, and canned fish. The May 1960 index was the highest since March 1959 when it reached 128.2 percent.

With haddock landings at New England ports falling off seasonally from the peak catches of March and April, the ex-vessel price at Boston went up 50 percent from April to May. This sharp price increase plus a further increase in the frozen king salmon price resulted in a 4.0-percent rise in the drawn, dressed, and whole finfish subgroup index. From April to May wholesale prices for fresh-water fish (with the exception of whitefish) leveled off from the high levels that prevailed during the April Jewish holidays. The subgroup price index this May as compared with May 1959 was up about 3.2 percent due to higher prices for frozen dressed salmon and fresh-water whitefish and yellow pike at New York City. These increases more than compensated for lower prices for fresh drawn haddock (down 3.0 percent), fresh and frozen halibut (down 12.6 percent), and Chicago drawn whitefish (down 4.5 percent).

The fresh processed fish and shellfish subgroup price index in May 1960 increased 6.3 percent from the preceding month due to a 9.7-percent increase in fresh shrimp prices at New York City and a 3.7-percent increase in shucked oyster prices. These increases more than compensated for a drop of about 1 cent a pound in the wholesale price for small haddock fillets at Boston. From May a year ago to this May this subgroup index rose 6.8 percent. Although the fresh haddock fillet prices were down sharply (21.7 percent) and fresh shrimp prices were lower by 1.2 percent, the increase of 22.2 percent in shucked oyster prices more than offset the decreases.



Heading and sorting halibut for size after unloading at the dock of a fishery firm in Seattle, Wash.

In mid-May 1960 the wholesale price index for processed frozen fish and shellfish increased by 1.3 percent from the preceding month. The wholesale prices for frozen 26-30 count shrimp at Chicago rose 4.7 percent or about 3 cents a pound. This jump in frozen shrimp prices was sufficient to overcome decreases of about 1/2 to 1 cent a pound in the wholesale prices for the frozen fillet items. In May this year the frozen processed fish and shellfish price index was down 1.8 percent from the same month of 1959. Although frozen shrimp prices were higher by 5.0 percent this May as compared with May last year, frozen haddock fillet prices were down 22.7 percent and flounder fillet prices were down 2.7 percent. Wholesale prices for frozen 26-30 count shrimp this May at 123.5 percent of the 1947-49 average were the highest since April 1959 when the index for this item was 128.1 percent. This price increase between April 1959 and May this year represents an increase of about 18 cents a pound from the low of 62 cents a pound reached in October 1959.

The primary wholesale canned fish price index was unchanged from April to May 1960. As compared with May 1959, the index this May was up 8.3 percent. All wholesale canned fish prices were higher this May than they were in May a year ago. Among the canned fish products included in this subgroup, the only product in good supply in May this year was canned tuna. Seasonal canning of Maine sardines and Pacific salmon began in May, but packs were extremely light.

Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, May 1960 With Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ (\$)		Indexes (1947-49=100)			
			May 1960	Apr. 1960	May 1960	Apr. 1960	Mar. 1960	May 1959
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned) . . . . .					126.6	123.3	123.4	121.7
Fresh & Frozen Fishery Products:					142.2	136.7	137.6	138.1
Drawn, Dressed, or Whole Finfish:					150.1	144.3	148.5	145.5
Haddock, lge., offshore, drawn, fresh . . . . .	Boston	lb.	.09	.06	94.1	60.8	116.9	97.0
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.30	.30	93.5	92.8	90.3	107.0
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.82	.80	184.8	179.2	174.7	174.1
Whitefish, L., Superior, drawn, fresh . . . . .	Chicago	lb.	.74	.98	183.4	241.7	195.8	192.1
Whitefish, L., Erie pound or gill net, rnd., fresh . . . . .	New York	lb.	1.05	1.05	212.5	212.5	144.7	192.1
Yellow pike, L., Michigan & Huron, rnd., fresh . . . . .	New York	lb.	.73	1.00	170.0	234.5	181.8	140.7
Processed, Fresh (Fish & Shellfish): . . . . .					145.8	137.1	142.2	136.4
Fillers, haddock, sml., skins on, 20-lb. tins . . . . .	Boston	lb.	.27	.28	91.9	93.6	117.4	117.4
Shrimp, lge. (26-30 count), headless, fresh . . . . .	New York	lb.	.86	.78	135.1	123.2	127.2	136.7
Oysters, shucked, standards . . . . .	Norfolk	gal.	6.88	6.63	170.1	164.0	167.0	139.2
Processed, Frozen (Fish & Shellfish): . . . . .					117.7	116.2	109.1	119.8
Fillers: Flounder, skinless, 1-lb. pkgs. . . . .	Boston	lb.	.38	.38	98.1	99.5	98.1	100.8
Haddock, sml., skins on, 1-lb. pkgs. . . . .	Boston	lb.	.26	.27	80.1	84.8	89.5	103.6
Ocean perch, skins on, 1-lb. pkgs. . . . .	Boston	lb.	.28	.29	112.8	116.8	114.8	112.8
Shrimp, lge. (26-30 count), 5-lb. pkgs. . . . .	Chicago	lb.	.80	.77	123.5	118.0	104.5	117.6
Canned Fishery Products:					104.8	104.8	103.8	98.6
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs. . . . .	Seattle	cs.	24.50	24.50	127.8	127.8	127.8	117.4
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs. . . . .	Los Angeles	cs.	11.10	11.10	80.0	80.0	77.9	77.9
Sardines, Calif., tom. pack, No. 1 oval (15 oz.), 48 cans/cs. . . . .	Los Angeles	cs.	8.00	8.00	93.9	93.9	93.9	83.9
Sardines, Maine, keyless oil, No. 1/4 drawn (3-3/4 oz.), 100 cans/cs. . . . .	New York	cs.	8.75	8.75	93.1	93.1	93.1	88.8

1/Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.



### "GHOST" NETS THAT FISH YEARS AFTER THEY ARE LOST

"Ghost" nets that go on fishing years after they have been lost at sea are presenting a novel problem in many parts of the world, especially in the heavily fished waters around Iceland.

Some of the problems created by "ghost" nets--which may be fancifully compared with the fabled Flying Dutchman--were discussed this week at the headquarters of the Food and Agriculture Organization (FAO), Rome, Italy, by the Chief of the Fishing Gear Section of FAO's Fisheries Division.

"The gear concerned in Icelandic waters is the bottom-set cod gill-net made of non-rotting synthetic fibres, mainly nylon," he said. "Such nets are fitted with metal or plastic floats which, like the nets themselves, do not rot, and when the nets are lost by the fishermen, for instance due to broken buoy ropes, they are maintained in a fishing position by the floats."

RETRIEVED NETS FULL OF DEAD AND LIVING FISH: "It is only recently that fishermen have generally realized that the lost bottom-set nets do go on fishing on their own," he continued. "This has been proved when nets are accidentally retrieved some months or even years after they were lost and are found to contain great quantities of rotten fish and fish bones as well as live fish."

"It is not suggested that this is at present a problem which threatens any fishery but it is quite clear that steps must be taken to prevent lost nets remaining in a fishing position," he stated. "But the extent of the potential threat is indicated by the fact that in Iceland each boat engaged in gill-netting operates 75 to 90 such nets, and that these nets, in total, stretch over a length of about 4 kilometres. In the heavily fished areas in Icelandic waters, where sea conditions are often very rough, many kilometres of nets are lost each year."

The Chief of the Fishing Gear Section pointed out that the threat arising from "ghost" nets is likely to grow more serious in those waters where gill-net fishing is practiced on a large scale but should also be given attention in the developing fisheries in Africa and Asia.

COTTON FLOAT LASHINGS MAY PROVIDE ANSWER: "Suggestions have already been made for solving the problem," he said. "For example, one proposal is that the floats of such nets should be attached by untreated cotton which would quickly rot away if the nets are lost. Released from the floats, the nets would sink to the bottom and cease to catch fish. However, float lashings of this type would have to be renewed periodically and would be the cause of a lot of extra work by the fishermen."

"We have brought this problem to the attention of the International Council for the Exploration of the Sea and the International Commission for the Northwest Atlantic Fisheries, both of which are studying the problem in the hope of finding a practical solution," he added.

With the extensive and still rapidly expanding use of many varieties of synthetic fibre nets, there is need to take effective, practical action.

SYNTHETIC FIBRE NETS VASTLY INCREASE CATCHES: "Nets made of nylon and other synthetic fibres, including new types which have been developed recently, have already proved a boon to fishermen," he stated. "A simple but often very effective gear, gill-nets can be operated even from primitive unpowered craft. They have been particularly valuable in the drive to increase fish production in underdeveloped countries. For example, FAO has helped to introduce synthetic fibre nets in India and many of the countries of Asia and the Far East, with the result that fishermen are catching as much as five times more fish than they were able to catch with their traditional nets made from local fibres."

"But," he concluded, "as experience shows, there are unexpected draw-backs to be found in any innovation although I am quite sure that we shall soon solve this problem of 'ghost' net fishing."



## International

### EUROPEAN FREE TRADE ASSOCIATION

#### CONVENTION RATIFIED BY MEMBER GOVERNMENTS:

The diplomatic representatives of the Republic of Austria, the Kingdom of Denmark, the Kingdom of Norway, the Portuguese Republic, the Kingdom of Sweden, the Swiss Confederation, and the United Kingdom of Great Britain and Northern Ireland on May 3, 1960, deposited the instruments ratifying the Convention establishing the European Free Trade Association, also commonly known as the Outer Seven. Thus the Convention comes into force.

This Association was created in terms of a trading, not a political, community; a community open to anyone willing to trade with it.

The purpose is to increase the flow of trade between the seven countries and thereby to improve the standard of living. The seven countries have jointly decided to lower the tariffs between them and form a Free Trade Area.

A statement by Sweden's Minister of Trade pointed out that ". . . The integration within EFTA is in itself important, but we will continue our efforts towards a wider European association and for the liberalization of world trade. It is difficult, however, to be optimistic about the immediate possibilities to reach agreement on such an association. We seem to have run into a situation where a widening rather than a narrowing of the gap between the different trade groups may be impossible to avoid. But we shall strive to overcome the present difficulties, as otherwise the consequences for Europe would be very serious indeed. Nor should we forget that a split between

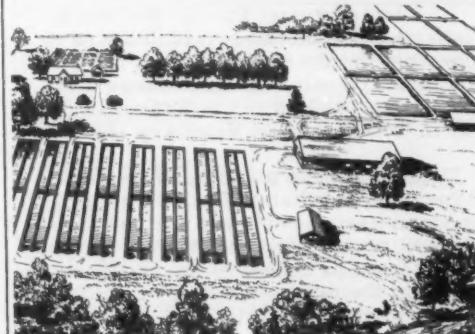
the industrialized countries of Europe would also mean reduced possibilities to help the underdeveloped countries--one of the main tasks of our time.

"The reason why I cannot be more optimistic now is the acceleration plan put forward by the Commission of the Six. Put into effect it would mean increased discrimination in Europe and a widening of the gap, even in a political sense. . ." (United States Embassy in Stockholm, May 4, 1960.)

### INTERNATIONAL PACIFIC SALMON FISHERIES COMMISSION

#### EXPERIMENTAL SALMON HATCHERY BEING CONSTRUCTED IN CANADA:

An experimental sockeye hatchery is now being constructed by the International Pacific Salmon Fisheries Commission on Pitt River. The spawning grounds of



the sockeye in Pitt River are very unstable, with the result that the native population is unable to reproduce at a competitive rate with highly productive up-river races such as Chilko which migrate through the fishery at approximately the same time. As a result of poor spawning conditions the Pitt River sockeye runs have declined in nine of the last ten years and the es-

**International (Contd.):**

capement is rapidly reaching an unimportant level.

The hatchery will have a starting capacity of 4 million fry and is expected to be in operation in time for the 1960 run. New principles of operation will be tried at the outset and others added when justified by current research. The eggs will be incubated in complete darkness to eliminate the known adverse effects of light. The fry will be allowed to migrate from the hatchery to Pitt Lake in accordance with their natural instincts rather than be subject to arbitrary plantings regardless of the stage of physiological development.

The Fisheries Research Board of Canada determined 20 years ago that the artificial propagation of Fraser River sockeye and the release of unreared fry did not justify the cost. The Commission believes, however, that new methods may provide for a successful operation and thus keep the Pitt River run of sockeye of sufficient size to utilize the tremendous rearing capacity of Pitt Lake which is 18 miles long.

\* \* \* \* \*

**FEBRUARY 1960 MEETING:**

The International Pacific Salmon Fisheries Commission, which is responsible for the preservation, protection, and extension of the sockeye and pink salmon stocks of the Fraser River, met in Ottawa late in February 1960.

Under the chairmanship of DeWitt Gilbert, United States Commissioner, the Commission reviewed the results of its work to date, and reported on its continuing work to conserve the two salmon stocks in the area covered by the Convention signed by the United States and Canada.

The Commission was originally appointed in 1937 to restore the sockeye stocks of the Fraser River system. The Convention under which the Commission was set up was amended in 1957 to cover the conservation of pink salmon stocks in the same area. (Canadian Department of Fisheries Trade News, March 1960.)

**LATIN AMERICAN FREE ECONOMIC ASSOCIATION****EXCHANGE OF RATIFICATIONS PLACES ASSOCIATION INTO EFFECT:**

With the exchange of ratifications, the Latin American Treaty of Economic Association is in full effect. The Treaty was signed in February 1960, by Guatemala, El Salvador, and Honduras. The common market between these three countries becomes a reality, since free entry is allowed in any one of the three countries to the natural products or to articles manufactured in either of the other two countries with the exception of a few products which are subject to special regulations.

A communique of the Guatemalan Ministry of Economy published in the Diario de Central America on May 3 announced the exchange of ratifications of the Treaty. Also, the text of the resolution on Central American economic integration recently approved at San Jose, Costa Rica, by the Central American Ministers of Economy, also was published.

In accordance with the Economic Association Treaty, it is expected in the near future to establish the Development and Aid Fund, whose purpose will be to contribute financially to the integration and development of the three countries; this entity will provide a new source of stimulus for private investment.

The Republic of Nicaragua, at the recent meeting of the Ministers of Economy held in San Jose, Costa Rica, also indicated its desire to proceed with an accelerated economic integration with the rest of Central America.

At the San Jose meeting an agreement was signed between the Central American governments and the United Nations Special Fund in order that this organization shall aid the Central American Industrial Technology and Research Institute (ICAIDI). On the basis of this aid, it is hoped that ICAIDI will be capable of giving service to Central American industry in an ever-increasing efficient manner.

At the San Jose meeting it was also resolved that the work towards Central American customs equalization shall continue at the end of May; therefore, it is

## International (Contd.):

expected that at the end of the year a Central American Uniform Customs Tariff Plan will be available. (United States Embassy in Guatemala, May 9, 1960.)

## LAW OF THE SEA

## CONFERENCE CONCLUDES WITHOUT ADOPTING PROPOSALS ON TERRITORIAL SEA AND FISHING ZONE:

In closing the United Nations Conference on the Law of the Sea in Geneva on April 26, 1960, the Conference President, Prince Wan Waithayakon (Thailand), expressed regret that it had not resolved vital problems affecting the width of the territorial sea and fishing zones.

The Conference concluded its work after rejecting or, because of the lack of a two-thirds majority, failing to adopt any substantive proposal on those two questions. It did, however, adopt a proposal expressing the need for technical assistance in fisheries.

In his statement, Prince Wan spoke of the need to make adjustments between the economic and political interests of coastal states and the principle of freedom of the seas. He expressed hope that, with good will, new efforts in due time would be made to arrive at agreement.

The session was formally completed April 27 with signature of the Final Act.

In a series of votes the Conference took the following action:

Failed to give a two-thirds majority to the United States-Canadian proposal which would have provided a six-mile territorial sea and granted another six-mile zone for exclusive fishing rights, with recognition of certain historical rights. The vote was 54 in favor, 28 against, with 5 abstentions. Those voting against the United States-Canadian proposal were Albania, Bulgaria, Burma, Byelorussia, Chile, Czechoslovakia, Ecuador, Guinea, Hungary, Iceland, India, Indonesia, Iraq, Libya, Mexico, Morocco, Panama, Peru, Poland, Romania, Saudi Arabia, Sudan, Ukraine, U.S.S.R., United Arab Republic, Venezuela, Yemen, and Yugoslavia. Abstaining on the United States-Canadian proposal were Cambodia, El Salvador, Iran, Japan, and the Philippines. Lebanon was absent.

Failed to give the required majority to a request by Arthur H. Dean (United States) for reconsideration of the vote on the United States-Canadian proposal. It received 50 votes in favor, 29 against, with 8 abstentions.

Failed to adopt the 10-nation proposal which would have left the width of the territorial sea in abeyance but would have granted a 12-mile zone of exclusive fishing rights. (The sponsors were Indonesia, Iraq, Lebanon, Mexico, Morocco, Saudi Arabia, Sudan, United Arab Republic, Venezuela, Yemen.) The vote was 32 in favor, 38 against, with 18 abstentions.

Rejected an Icelandic proposal under which preferential fishing rights would be granted to countries "overwhelmingly dependent" upon their coastal fisheries. The vote was 25 in favor, 37 against, with 26 abstentions.

Before voting on the United States-Canadian proposal as a whole, adopted an amendment to it submitted by Brazil, Cuba, and Uruguay, seeking preferential rights in zones of the high seas for countries particularly dependent on fishing. The vote was 58 in favor, 19 against, with 10 abstentions.

Adopted a proposal for technical assistance in fishing, sponsored by Ethiopia, Ghana, and Liberia. The vote was 68 in favor, none against, with 20 abstentions.

In the course of the discussion preceding the voting, Dean (United States) spoke of the concessions made by the maritime powers, and cited the "large majority" support for their stand, as opposed to the position of the minority. The 12-mile states, he said, had not made a single step toward general agreement.

A. K. Sen (India), explaining his vote against the United States-Canadian proposal, said that many countries feared the appearance of foreign warships close to their shores. In the first place, he said, there was no need for these warships to come so close. Twelve miles were required.

Grigori Tunkin (USSR), speaking in support of 12 miles and against the United States-Canadian proposal, said that 12-mile states, including China, represented 60 percent of the world population, and decisions could not be imposed.

Andre Groux (France), in announcing his decision to vote in favor of the United States-Canadian proposal, asked why 45 states, ever since the 1958 Conference on the Law of the Sea, had been making more and more sacrifice of legitimate interests while others had not even made a gesture of moving toward agreement.

Lubomir Radoulski (Bulgaria) warned that 12-milers would not recognize any six-mile decisions.

Najib Bouziri (Tunisia) said the existing situation of various limits was likely to prevail and the *modus vivendi* should be found perhaps through the adoption of the joint United States-Canadian proposal, but with continued regarding toward the 12-milers.

Gudmund Gudmundsson (Iceland), replying to an earlier suggestion by the United Kingdom representative for arbitration of historic fishing rights off Iceland, said that the Conference itself was competent to decide, and he wondered whether Britain wanted to avoid putting its position to a vote of the general Conference.

James Dossen Richards (Liberia) and E. K. Dadzie (Ghana) called for support for their proposal on technical assistance.

Edwin Glaser (Romania) said that a bad solution was worse than no solution and he opposed the United States-Canadian proposal.

Alvaro Garcia Herrera (Colombia) supported as "reasonable solutions" the United States-Canadian proposal and the Latin American amendment.

Gideon Rafael (Israel) supported the United States-Canadian proposal and the request for technical assistance.

Antoine Fattal (Lebanon) said his major concern was preservation of the Arabic nature of the Gulf of Aqaba. He found the United States-Canadian proposal unsupportable toward that aim and said he would abstain.

After the series of votes, Turkey and Canada informally suggested the possibility of prolonging the Conference so that new efforts could be made, but the suggestions were not voted upon.

On April 26 the Conference failed to adopt a Cuban proposal for a protocol to the 1958 Convention on Fishing and Conservation of the Living Resources of the High Seas. The vote was 33 in favor, 22 against, with 24 abstentions.

*Note: Also see Commercial Fisheries Review, June 1960 p. 39.*

## NORTHWEST PACIFIC FISHERIES COMMISSION

## JAPANESE-SOVIET NORTH PACIFIC SALMON FISHERY AGREEMENT SIGNED:

A Japanese-Soviet fisheries agreement limiting salmon catches in the northwest Pacific was signed on May 18,

## International (Contd.):

1960. Negotiations between the two countries began in Moscow on February 2.

At the fourth annual meeting of the Japanese-Soviet Commission for Northwest Pacific Fisheries, the Soviets charged that indiscriminate Japanese fishing was preventing salmon from reaching the spawning grounds. The Russians proposed a complete ban on salmon fishing in half the area under discussion and a shorter fishing season in the other half.

In the agreement, which covers catches of salmon, crab, and herring, the Japanese accepted a quota of 67,500 metric tons of salmon this year in exchange for fishing rights in the previously restricted areas. Also, the Japanese agreed to accept closure of two new areas. The first is a triangle bounded by the southern Kuriles, the treaty area boundary, and 150° E. longitude. The second is a rectangle bounded by 46° N. and 48° N. latitudes, 155° E. and 160° E. longitudes. The quota for red salmon, within the over-all quota of 67,500 tons, is 15,500 tons or about 7,750,000 fish. The Japanese wanted a quota of 85,000 tons of salmon, the same as in 1959. In 1958, the quota was 110,000 tons. This year's quota for red salmon is 500 tons less than last year's.

The Soviets state that the limits on salmon catches are necessary to preserve dwindling stocks. The Japanese biologists disputed the Soviet claim.

## TRADE AGREEMENTS

**NEW PROTOCOL TO ICELANDIC SOVIET TRADE AGREEMENT INCLUDES FISHERY PRODUCTS:**

The new 1960-1962 Protocol to the Icelandic-Soviet Trade Agreement of August 1, 1953, was signed in Moscow on January 23, 1960. It is believed that the new arrangement provides for approximately the same level of trade as prevailed during the past 2 or 3 years.

On the Icelandic export side, the most notable change is the reduction envisaged in salt herring shipments from 15,000

metric tons for 1957-1959 to 12,000 tons (150,000 to 120,000 barrels) per annum for 1960-1962. It is understood that the Soviet delegation wished to make a much deeper cut but that the Icelandic group insisted on 12,000 tons. This reflects the actual tonnage of salt herring actually purchased by the U. S. S. R. annually from Iceland during the past three years under the agreement.

As provided for in the 1960-1962 protocol, the most important export from Iceland will again be frozen fillets (30,000-32,000 tons annually), chiefly ocean perch and a small amount of cod. In 1957-1959, the amount was 32,000 tons annually. The contracts on fish provide for 30,000 tons of frozen fish fillets to be delivered to the Soviet Union during the calendar year 1960. The U. S. S. R. purchased 28,800 tons in 1959. The possibility is left open that additional amounts could be contracted for. Partly as a reflection of rising prices during the past several years on the world market for frozen fish products, the fish contract calls for a rise of approximately 3 percent in the price of ocean perch delivered to the Soviet Union, but no rise in the price of cod.

The 1960-62 agreement also provides for an unspecified quantity of frozen herring (the agreement for 1957-59 called for 1,000 tons).



## Australia

**MODERN TRAWLER TO EXPLORE FOR NEW DEEP-SEA FISHING GROUNDS:**

The modern 514-ton deep-sea fishing trawler, *Southern Endeavor*, which arrived at Adelaide in January 1960 from Great Britain, will be used to survey the Great Australian Bight located off the South Central Coast for new deep-sea fishing grounds. A recently established trawling company based in Adelaide has given the vessel and her all Australian crew the task of locating sufficient quantities of fish to warrant the establishment of a deep-sea trawling industry. The *Southern Endeavor* will have one year to complete the task. If fish are found to be abundant the vessel will have paved the

## Australia (Contd.):

way towards replacing large quantities of imported fish.

The vessel's captain, who is an experienced trawlerman, states that the venture is a blind gamble, but no more of a gamble than experienced when other new fishing grounds such as Greenland were opened up to fishing. He added, conditions may be different, but fishermen's techniques are the same wherever you go.

The Southern Endeavor was built in 1952, at a cost of more than £150,000 (about US\$336,000), and, as the Princess Elizabeth, has fished in the Arctic fishing grounds. The 161-foot vessel has a speed of 12 knots. (Fish Trades Review, January 1960.)

\* \* \* \* \*

**SURVEY FOR SPINY LOBSTER RESOURCES OFF SOUTHWEST COAST UNSUCCESSFUL:**

An Australian Government survey of spiny lobster resources off the southern coast of Western Australia, begun in June 1959, was three months ahead of schedule when it was determined that spiny lobsters do not occur in those waters in sufficient numbers to support a commercial fishery. The survey, which was to continue until June 1960, thoroughly covered the area between Cape Riche and Nuyis Point, the Recherche Archipelago, and the area from Cape Leeuwin to Cape Naturaliste. It was financed from the Fisheries Development Trust Account.

Australia exported close to 7 million pounds (valued at US\$6.9 million) of spiny lobster tails to the United States during fiscal year 1958/59. The great majority of the exports has come from fishing grounds which have been developed along the coast of Western Australia in recent years. (The United States Embassy in Canberra, April 8, 1960.)

**Bermuda**

**DEVELOPMENT OF FISHERIES UNDER CONSIDERATION:**

Until now there has been no separate department of the Government devoted to the fishing industry. The responsibility for the promotion of commercial fishing has been charged to the Curator of the Aquarium--whose main duties relate to the operation of that tourist attraction.

In April it was announced that the Department of Agriculture will, in the near future, become the "Department of Agriculture and Fishery," embracing a new branch for the promotion of commercial fishing. This move is the result of a strong recommendation to that effect by several experts who conducted a Government-sponsored inquiry into the Colony's commercial fishing potentialities and issued three detailed reports between June 1955 and August 1958. To date, the only active measure by the Government to conserve the Islands' edible sea resources has been a ban on the possession of spiny lobsters from April 15 to August 31 of each year. A bill to set back the date of the beginning of the closed season to April 31--and thus to enable local hotels and restaurants to feature lobsters on Lenten and Easter menus--was passed by the House of Assembly in March, but a few days later was rejected by the Legislative Council.

Despite the fact that Bermuda is surrounded by a 450-square-mile reef area teeming with fish, an estimated 40 percent of all fish consumed in the Islands is imported. In 1957, these imports amounted to about 620,000 pounds; in 1958, 700,000 pounds; and in 1959, about 725,000 pounds. The local catch is estimated at 1,250,000 pounds a year. The increasing use of freezers by the Colony's hotels, restaurants, markets, and households has encouraged increased importation of fish.

Only about 100 Bermudians are engaged in full-time commercial fishing. Their boats are small, and lack Diesel engines and refrigeration facilities. As a result, long and expensive daily round trips are required in order to reach the best fishing grounds ("the banks," located 25 to 35 miles southwest of Bermuda).

**Bermuda (Contd.):**

Furthermore, adverse weather restricts their activity, and the total catch during winters drops as much as 80 percent. The fact that the fishermen have been eking a fair living out of the sea has restrained them from seeking Government aid or even advice.

The establishment of a Department of Agriculture and Fishery may mark the beginning of an important new industry in Bermuda. If the Government earnestly adheres to its oft-announced policy of fostering greater domestic food production in order to reduce reliance on imports, there is much it can do to promote the production of food from the sea, just as much has already been done through the Department of Agriculture to foster production of food from the land. Among the possible courses of action are: the granting of a yearly subsidy (a 10 percent subsidy at current rates would be about US\$35,000 a year); the acquisition of large, Diesel-engine, freezer-equipped vessels with modern fishing gear capable of fishing several days at a time; construction of large-scale freezing plants and other storage facilities; establishment of an island-wide system of marketing; compilation of statistics on the size, composition, and trends of the catches; and the development of a research program. (United States Consulate report from Hamilton, April 29, 1960.)

**Brazil****FISHING OPERATIONS BY JAPANESE CRITICIZED:**

It is now estimated that there are 55 Japanese fishing vessels operating off Brazil's northeastern hump fishing for tuna. Ranging in size from 80 tons to 800 tons, the Japanese vessels are becoming an increasingly sore subject for the nonmechanized Brazilian fishing industry. Presently only one of the vessels operates from Brazilian ports.

The Japanese firm participating in the INBRAPE (Industria Brasileira de Pesca e Frios S/A) operation in Recife is also

being scrutinized by a representative of the Ministry of Agriculture and Fisheries who arrived in Recife during March.

Critics report that the Japanese boats are continually being switched to avoid the nationalization of the boats as their contract requires and that Brazilian fishermen hired by the Japanese as trainees (also under the terms of the agreement) are discharged as they approach the proficiency required for the mastery of modern fishing techniques. (United States Consulate report from Recife, April 19, 1960.)

**British Guiana****FISHING INDUSTRY EXPANDS IN 1959:**

The British Guiana fishing industry made notable progress in a number of different fields during 1959. The year's biggest success was undoubtedly achieved by an American-owned fisheries and trading company, which after three years of frustrating and profitless operations, at last found shrimp in sufficient quantities in April 1959. Between April and December, the company exported, mostly to the United States, about 1,140,000 pounds of shrimp, valued at about US\$745,000. This in turn stimulated interest among American shrimp vessel owners and in local business circles, and a marked expansion of shrimp fishing out of British Guiana is expected in 1960.

The biggest plans are being laid by a new firm which bought out the fisheries and trading company early in 1960. This new firm is working to double the size of its fishing fleet (from 20 to about 40 boats), expand its cold-storage and ice facilities, and purchase additional wharfage space in Georgetown harbor. Other American shrimp fishing companies have shown an interest in coming to British Guiana, and the New Amsterdam Chamber of Commerce has begun negotiations with French and Japanese interests in the hope of enticing a shrimp fishing operation into Berbice. The British Guiana Government is hopeful that the industry can provide additional jobs in the Georgetown area. The new seafoods company employs about 200 workers.

Spurred on by the good shrimp landings, the Government has intensified its own efforts to boost the annual production of fish. A research project to test offshore fishing grounds was completed in early 1959, and the Fisheries Division of the Department of Agriculture reported that the most productive areas were found between 10 and 20 fathoms. Following this survey, reports indicated that some 500 small fishing craft and several deep-sea trawlers began fishing in earnest in these waters. Catches ran as high as 30,000 pounds for the large trawlers, and by the year's end, the Government wholesale fish marketing center reported that 6,659,000 pounds of fish had passed through the municipal market at Georgetown. Encouraged by these figures, the Government announced that all fish imports would be stopped at some unspecified future date. This proposal does not, however, appear to be realistic, for fish imports for 1959 again totaled about 6 million pounds.

Another minor success in 1959 was scored by British Guiana's small but growing tropical fish-exporting companies. Sales of guppies and other small aquarium fish totaled about US\$400,000, with the United States purchases about 90 percent of British Guiana's exports. Demand apparently surpasses available supply, but the industry has thus far failed in its efforts to cultivate these exotic fish in ponds. However, such artificial cultivation continued to be successful at Onverwacht, the Government fish culture station in West Berbice where edible

**British Guiana (Contd.):**

fish are raised in sea water. This station again expanded its operations in 1959 in the hope of inducing private individuals or cooperatives to establish fish ponds. (United States Consulate report from Georgetown, April 26, 1960.)

**British West Indies****BARBADOS FISHING INDUSTRY  
IMPORTANT AS A SOURCE  
OF BASIC FOOD:**

The fishing industry of Barbados in the British West Indies is an important source of a basic food for the population and employment for about 2,300 persons. In 1959 the fisheries landings sold through established fish markets were valued at US\$1,687,000, a slight drop from the 1958 value of \$1,702,000. The total of fisheries landings is about 10 percent higher when sales outside of established markets are included.

Flyingfish account for 60 percent of the landings, with dolphin, kingfish, albacore, and red snapper following in that order. Spiny lobster and turtle are also caught and marketed.

The fishing fleet has largely been converted from sail to power boats with the assistance of Government loans, and the number of power-driven boats increased from 412 in 1958 to 451 in 1959.

The 1960/61 budget provides US\$1 million for an abattoir and fish-freezing plant which, when completed, will provide storage and insure more orderly marketing and better distribution. (United States Consulate report from Barbados, April 28, 1960.)

**Burma****FISHERY TRENDS,  
FOURTH QUARTER, 1959:**

The Burmese Government Defense Services Institute (DSI) has established a joint fishery venture with a Singapore fishing company. Deep-sea fishing operations about 80 miles off the coast of Mergui (East of the Andaman Islands)

were started in October 1959 with 14 motor trawlers from Singapore. The DSI takes 65 percent and the company 35 percent of the catch. The vessels are manned by about 100 Chinese fishermen from Singapore, with about 80 Burmese undergoing training. It is reported that the number of trawlers is to be increased to 50, and that the area of operations will be extended to waters off the Arakan coast.

During the fourth quarter of 1959 an official of the Institute, during his trip to Europe, arranged with the Norwegian Government for a deep-sea fishing survey in Burmese waters. Arrangements were also made to send Burmese to Norway for training in deep-sea fishing. The Government recently issued over US\$3 million in import licenses for fish, with the Army Fisheries Project the sole purchasing agent. The DSI hopes that the survey and training of Burmese will ultimately enable it to fulfill Burma's fish requirements from an entirely home-based industry, under DSI control. (United States Embassy, Rangoon, report of April 5, 1960.)

**Canada****ARCTIC CHAR FISHERIES:**

The Arctic Unit of the Fisheries Research Board of Canada is studying arctic char in Frobisher Bay, in association with the commercial fishery being operated there by Eskimos under the supervision of the Department of Northern Affairs. Another arctic char commercial fishery is in operation in Ungava Bay, also under the sponsorship of the Department of Northern Affairs. This is under biological study by the Quebec Department of Fisheries, which is working closely with the Board's Arctic Unit.

\* \* \* \* \*

**LOBSTER SEASONS CHANGED IN  
CERTAIN AREAS OF MARITIMES:**

Changes in the regulations affecting lobster fishing in two Canadian Maritimes lobster districts have gone into effect. The changes apply to District 8, comprising Kent and Westmorland Coun-

**Canada (Contd.):**

ties in New Brunswick and the western half of Cumberland County in Nova Scotia, and District 5, which takes in the Guysborough County and the eastern half of Halifax County in Nova Scotia.

In District 8 the open season for catching lobsters has been changed to extend from August 10 to October 10, which is five days longer than in 1959. In District 5 there has also been a lengthening of the open season, with fishing being permitted ten days earlier, so that the legal catching period now is April 10 to June 20.

These slightly longer seasons will have no detrimental effect on conservation and will bring them more in line with seasons in other districts.

In addition to these changes, in District 5 the minimum size at which lobsters may be taken has been increased from  $2\frac{1}{8}$  inches to 3 inches. This is in accordance with the expressed desire of the great majority of fishermen in the area.

\* \* \* \* \*

**RESOLUTIONS ADOPTED AT THE 15TH ANNUAL MEETING OF THE FISHERIES COUNCIL OF CANADA:**

At the 15th Annual Meeting of the Fisheries Council of Canada in Vancouver, B. C., April 25-27, 1960, the resolutions adopted by the Meeting ask the Canadian Government to:

1. Repeal a law which discriminates against East Coast fishermen competing with foreign vessels.
2. Remove hindrances to the adequate building up of the Canadian fishing fleet.
3. Put an end to its activities in the competitive field of food merchandising in the domestic market where it has offered pork products at less than cost.
4. Participate in an international conference on fish meal production if such a conference is arranged.
5. Arrange that the Fisheries Research Board of Canada set up a special

research program to develop other uses and products from the British Columbia herring and whaling resources.

6. Sit down with industry to jointly explore the desirability of a market research program in Canada aimed at uncovering the basic attitude of the Canadian consuming public towards fish on which future promotional programs, both by Government and industry, can be based.

7. Implement a study of methods to encourage the production of better-quality light-salted and heavy-salted cod.

\* \* \* \* \*

**SCALLOP LANDINGS EXPECTED TO INCREASE IN 1960:**

Scallop landings in the Canadian Maritime provinces this year are expected to surpass those of all former years. January to October 1959 the Canadian fleet landed 4 million pounds of scallop meats as compared with 2.9 million pounds for the same period in 1958, an increase of 40 percent. The value of those landings increased from C\$1.1 million in 1958 to C\$1.6 million in 1959. The increase in landings was the result of increased efforts by offshore vessels fishing Georges Bank, off the Gulf of Maine. Inshore landings were greatly reduced.

The study of the sea scallop is being renewed by both Canadian and United States scientific investigators. One set of experiments has already been completed on Georges Bank, with a large-mesh scallop dredge, which is designed primarily to reduce the number of small unmarketable scallops which are damaged and thus wasted by handling onboard fishing vessels. The dredge also improves efficiency in the capture of market-size scallops.

The joint Canadian-United States studies are being carried out at the request of the International Commission for the Northwest Atlantic Fisheries. In the immediate future the program calls for an investigation into how the scallop lives and reacts to its environment and to fishing gear in order to better appreciate its population dynamics. The first task is to study the early free-swimming larval stages which at present are

**Canada (Contd.):**

almost unknown, but are undoubtedly of great importance in determining the densities of future scallop populations. (Canadian Trade News, March 1960.)

**Cuba****CLOSED SEASON ON FROGS ENDED, BUT ONE ON SEVERAL SPECIES OF FISH ANNOUNCED:**

The Cuban National Fisheries Institute, by a Resolution published in the Official Gazette No. 86 of May 5, 1960, imposed a closed season on the species biajaiba (lane snapper), corvina (croaker), and robalo (snook). The capture of those species is prohibited effective from May 5, 1960, through August 5, 1960.

Another resolution published in the same Official Gazette terminated the closed season on the capture of the bullfrog species had originally been imposed on April 1, 1960. (United States Embassy report from Habana, May 10, 1960.)

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**CLOSED SEASON ON SPONGES ANNOUNCED:**

The Cuban National Fisheries Institute, by a Resolution published in Official Gazette No. 80 of April 26, 1960, declared a closed season on the taking of sponges from April 25, 1960, to July 25, 1960, both dates inclusive. The area included in the closed season prohibition covers the western maritime zones, and the zones north of Cibarién and south of Batabanó. The taking of sponges in the north coast of Vuelta Abajo, Pinar del Rio Province, however, is permitted. (United States Embassy report from Habana, May 4, 1960.)

**Denmark****RAINBOW TROUT PRODUCERS ASSOCIATION DISSOLVES:**

On April 27, 1960, the Danish Minister of Fisheries declared himself unable

to decree minimum prices for trout exports, in the face of an unfavorable Government Industry Committee vote on the proposal to continue existing price arrangements until June 1, 1960. On May 2, the Association of Trout Producers dissolved itself for announced reasons of "mutual disunity."

The immediate cause for these events was the recent discovery that two trout producers in North Jutland had exported large trout shipments to the United States and Canada at prices significantly below the agreed minimum.

The meeting of the trout producers at Esbjerg on May 2 was called ostensibly to reconsider methods of price control. A system of export fees, variable according to the export market, was reported to be under consideration, as well as other measures to prevent a price war. The inability of the producers to agree on any scheme resulted in the decision to dissolve the organization.

Stocks of exportable trout are low in the spring, so the effect of the abolition of the minimum on export prices will probably be postponed for some months. Price cutting is expected, however, because of the competition between Japan and Denmark on the United States market. (United States Embassy report from Copenhagen, May 4, 1960.)

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**SOME FISHERY PRODUCTS NO LONGER REQUIRE IMPORT LICENSES:**

As of March 1, 1960, the Danish Government extended the list of imported products that no longer are subject to import license requirements. Among the products no longer subject to import licensing are: fish and shellfish for canning; and canned fish products. (Foreign Trade, May 7, 1960.)

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**UTILIZATION OF FISHERY PRODUCTS, 1958-1959:**

During 1959, Denmark utilized 591,276 metric tons of fishery products. This represents an increase of 10.3 percent over the 536,144 tons used in the preceding year. As compared with 1958,

## Denmark (Contd.):

the amount of herring available in 1959 dropped by 9.3 percent, but the quantity of miscellaneous fishery products (prob-

Denmark's Utilization of Fishery Products, 1958 and 1959		
	1959/	1958/
Plaice and flat-fish fillets . . . . .	17,683	12,672
Flounder . . . . .	4,141	3,916
Dab . . . . .	3,135	4,574
Cod and cod fillets . . . . .	38,078	39,385
Herring . . . . .	264,569	298,271
Sprat . . . . .	8,303	8,329
Mackerel . . . . .	9,213	10,069
Garpike . . . . .	924	1,184
Other salt water fish <sup>3/</sup> . . . . .	229,655	142,439
Total salt-water fish . . . . .	575,701	520,839
Eel . . . . .	251	174
Pond, trout . . . . .	586	531
Fresh water fish . . . . .	57	104
Total fresh-water fish . . . . .	894	809
Mussels (in shell) . . . . .	8,856	8,461
Starfish . . . . .	2,364	2,984
Crustacea . . . . .	3,461	3,051
Total invertebrates . . . . .	14,681	14,496
Grand Total . . . . .	591,276	536,144

1/Preliminary figures.

2/Final figures.

3/Includes fish for reduction.

ably large quantities of fish for reduction) increased by 61.2 percent. (United States Embassy report from Copenhagen, May 6, 1960.)



## Ecuador

FOREIGN VESSELS PERMITTED  
TO FISH FOR BAIT IN  
TERRITORIAL WATERS:

In Decree No. 464-c of March 4, 1960, published in the Registro Oficial No. 1091 of April 9, 1960, Ecuador authorized commercial fishing by foreign vessels in Ecuadoran continental and insular territorial waters upon obtaining the applicable permits. This permission does not extend, however, to cod, shrimp, lobster, or whales.

The decree prohibits both Ecuadoran and foreign vessels from fishing for bait in zones within one kilometer along the coast from both sides of coastal towns and one kilometer into the ocean. Domestic fishermen ("pescadores domésticos"--presumably those without power-driven boats), however, may fish within these areas.

Foreign fishing vessels are forbidden to enter the mouths of estuaries in the Gulf of Guayaquil and the Archipelago of Jambeli or to engage in fishing activities beyond an imaginary line running in an east-west direction across the mouths of the Guayas River and the Estero Salado from Boca de Naranjal ( $2^{\circ}39'30''$  S. lat. and  $79^{\circ}56'5''$  long.) to Boca del Morro ( $2^{\circ}39'5''$  S. lat. and  $80^{\circ}15'$  W. long.).

Captains of foreign vessels which engage in commercial and bait fishing in Ecuadoran continental and insular territorial waters are required to submit to Port Captains detailed reports of their catches, including amounts, species, and locations.

This decree annuls previous decrees and dispositions, in particular Decrees Nos. 955-A of April 29, 1955, and 1085 of May 14, 1955, which prohibited or limited foreign vessels from fishing in these waters. Its practical effect is to permit bait fishing by foreign vessels within the one kilometer limit from the coast where it was previously forbidden, except in the immediate vicinity of towns, and also within the Gulf of Guayaquil, including the Morro and Jambeli Channels. The decree is an effort to legalize the existing situation and to derive revenue through the sale of fishing permits.

Although fishermen at Manta have protested the decree and have complained that better equipped foreign vessels get the bulk of available bait, there has been relatively little other unfavorable reaction to the decree. The Guayaquil newspaper El Telegrafo in an editorial of March 13, 1960, supports the decree on the grounds that the Government now will obtain revenue from heretofore clandestine fishing. The Consulate General in Guayaquil reports that a European marine biologist has informed it that there is sufficient bait for all and that fishing by foreign vessels is not causing a local shortage. (United States Embassy, Quito, May 4, 1960.)



## El Salvador

### SHRIMP FISHERY TRENDS, FIRST QUARTER 1960:

At the end of the January-March 1960 quarter the President of El Salvador, in analyzing the local shrimp industry, noted that licenses had been granted for 58 shrimping vessels, of which 47 are presently operating. For the first two months of 1960, catches were at a level three times those of the same months of 1959, largely due to the increased size of the fishing fleet. Most of the production is being marketed in the United States, and the largest producer (with over half the operating craft) is preparing to sell its own name brand in the United States.

Present participants in the industry are now joining the Government in calls for conservation measures. Meanwhile, talk of possible United States quota restrictions against shrimp imports are causing considerable concern to the Salvadoran Government (shrimp is the country's third largest export product) and to the industry. (United States Embassy, San Salvador, report of April 13, 1960.)



## French West Africa

### CONFERENCE DISCUSSES FUTURE OF SENEGALESE TUNA FISHING AND CANNING INDUSTRY:

Plans for the future of the tuna fishing and canning industry that is centered in the Dakar area were discussed on January 29 and 30, 1960, at a conference between French, Senegalese, and Mali government and industry officials.

Heralded as "Tuna Fish Days," it was another example of the growing impetus being given to the tuna industry in Senegal, the latest indication of which was the creation on March 9, 1960, of a Fisheries Council by Decree No. 60-105 of the Council of Ministers.

The conference was devoted to studying the problems of the current tuna as well as defining the expected policies of Senegal for the development of the tuna industry and the potentials which are

presented for Senegal in the European Economic Community (EEC) and world markets.

In regard to the 1959/60 tuna fishing season, it was revealed that although original plans called for 40 tuna clippers, a total of at least 56 tuna-fishing boats were active, nine of which are equipped with freezing plants. It was hoped that 16,000 metric tons of tuna would be landed in the 1959/60 season, of which 7,500 tons would be canned in Dakar.

To assist in the total catch, the native fishery would make a contribution. It was pointed out at the Conference that over 45,000 tons of many varieties of fish were caught annually by around 10,000 fishermen utilizing 3,000 of the native "pirogues." However, 80 percent of this catch is sold fresh, and is mostly caught within the maximum five-mile range of the nonmotorized "pirogue."

The plans developed by the conference for developing the tuna fishing industry are ambitious and if realized, will create a major new industry for Senegal. Foremost amongst these plans to make Dakar one of the world tuna centers is the intention to erect a "California" type processing plant with a yearly capacity of 50,000 tons. This would be part of the proposed new fishing pier in Dakar, and if realized, would consist of not only the processing and freezing plant, but also an area for drying fish, a can manufacturing plant, and facilities for efficient disposal of waste from the fish processing operation.

To accomplish this goal, Senegal has requested assistance amounting to 300 million francs CFA (over US\$1,220,000 at the official rate of 246.8 francs to the dollar) from the EEC Development Fund, which, it is understood, will be granted in the not distant future. Also, a commission has been established to study the technical, legal, and commercial aspects of this development, and private enterprise is being sounded out with the hope of creating a mixed public and private company for the management of the planned cannery.

Other future projects were likewise considered during the conference. Foremost among these is a general improve-

**French West Africa (Contd.):**

ment of the shore facilities and equipment. Beaching facilities are to be improved where possible. A project receiving wide publicity is the motorization of "pirogues," 30 percent of which are already equipped with outboard motors for which the government pays 15 percent of the price to assist the individual fisherman in modernization. In 1951, motorized "pirogues" hardly existed and their effectiveness is reflected in the fact that the catch went up 10,000 tons in a few years.

On a larger scale lies the desire to create a larger Senegalese tuna fleet, since at present the majority of the vessels operating in the area are French or Spanish, the latter currently owning 16 of the total of 56. With the construction of the processing plant, it is hoped that all foreign ships will be drawn to Dakar to process their catch thus making it the tuna capital of the Atlantic.

The problem of markets was explored vigorously. While expressing the hope that the Community will provide a preferential market, the participants in the Dakar conference on tuna gave indications of pressing for a broader horizon of activity on which the United States, and particularly the EEC, appear in the forefront. Great interest was shown in extending the market, already existing in Italy, into Germany, which promises large consumption, particularly of canned tuna in brine. For this purpose, extensive participation is planned in West German trade fairs to promote African tuna sales.

Pressure will probably be put upon France to direct more of its tuna purchases to Senegal, which is complaining about low-priced acquisitions from Morocco, Tunisia, and New Hebrides by the French market.

There is also the hope that the interior market of Africa can be enlarged by sales promotion activity. In confirmation of the importance of the tuna industry, as displayed by the conference, the latest manifestation of Senegal's interest is seen in the establishment of a Fisheries Council on March 9, 1960. It

is to act as a consultative body for matters concerning maritime fishing, and is to study technical, juridical, social, and economic questions which are brought to its attention by the Government or by private enterprise. It has to prepare administrative plans and organizational programs, and coordinate under the direction of the Administration the interests and activities of the different professional elements.

The Council is composed of representatives of the various ministries, services, and agencies, the legislative assembly and the Mali Government. In addition to these, representatives of the various fishing industries, such as the tuna industry and fishery cooperatives, are to be appointed by ministerial decree, and experts and specialists may be called upon as the situation requires it.

Statements by representatives of both Senegal and France emphasized the desire for cooperation, and it will probably be along such lines that events will develop. However, clashes between representatives of African and French tuna interests occurred during the conference, showing the possibility that perhaps at some future time differences might arise on the subject. The main source of friction resided in the easy availability of French markets to nations outside EEC, French acceptance of bonito from Morocco in direct competition with Senegal's albacore, and the desire on the part of Senegal to have its own fleet which, naturally, would tend to displace some of the French clippers.

Native fishing continues to receive a big push from the Sengalese Government, and with considerable success. Although this does not have much bearing on world markets, it is of great importance to Senegal as fish enters heavily in the diet of the Africans.

The important factor as to the actual wealth of the fishing grounds off the coast of Senegal was not discussed at the conference. The impression was given that all concerned took it for granted that the supply of fish was plentiful and that a shortage was not expected to develop in subsequent years even when

### French West Africa (Contd.):

the catch is greatly increased. (United States Consulate in Dakar, April 4, 1960.)



### Gabon Republic

#### WHALING INDUSTRY REVIVED IN 1959:

In 1959 whaling was resumed off the coast of Gabon (formerly part of French Equatorial Africa) after an inactive period of seven years. The industry is small and the monopoly of one company (Sté des Pêcheries Coloniales à la Baleine), but it provides one more source of revenue for the new Republic.

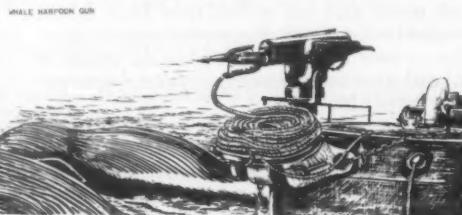
Each year from July-October the coast of Gabon is frequented by schools of migratory humpback whales from the Antarctic. The whales average 35 to 40 metric tons, and provide 7-8 tons of oil and 2 tons of whale meal. After World War II, a small industry was built up by the whaling company from a base at Cap Lopez near Port-Gentil. The company used seven catcher vessels of 250 tons, one factoryship of 10,000 tons, and killed 4,207 whales which produced 29,718 tons of oil and 3,673 tons of meat. Ruthless hunting soon depleted the stocks to where operations were unprofitable and in 1953 all whaling was halted. By 1959, the whale stocks had built up again to the point that the Government of Gabon authorized the renewal of the industry with controls on the number of whales taken.

On March 13, 1959, the whaling firm was given exclusive rights to whaling off Gabon for five years (1959-1963). It is

capital is 35 percent of the total of US\$303,000. The whale limit was 600 for 1959 and the season was established for August and September in conjunction with the International Whaling Convention. The number of hunter boats is also controlled. The Cap Lopez Station, which was constructed in 1949, comprises 34 autoclaves and a factory for preparation of whale meat meal for fodder; and it employs 300 persons. The whaling fleet is composed of one 16,000-ton Norwegian tanker, one naval auxiliary (M/S Pontos), and two hunter boats with crews totaling 96 men.

During the 1959 season considerably less than the 600 whale limit was obtained. A total of 178 whales were killed and produced 1,375 tons of oil and 322 tons of whale meal, making the season a net loss. It is expected that 1960 will be more favorable. One of the problems encountered, and probably a reason for the low catch in 1959, is the activities of the offshore seismicographic survey teams making oil explorations. The dynamite explosions scared away some whales and after numerous irate whaler complaints the seismicographic teams are now under orders to stop explosions when whales are nearby.

Gabon expects an annual revenue of US\$40,000-\$70,000 from the industry in turnover and other taxes. This is considerably less than was obtained during the previous whaling period after World War II. The Government hopes, however, to avoid overhunting again and thus insure a longer period of activity even if at a lower profit. Since offshore oil exploration is expected to cease in the next year in the region, chances are favorable that the whaling industry will remain for a number of years. (United States Consulate in Brazzaville, January 16, 1960.)



a French-controlled company with Norwegian participation. The Norwegian



### Hong Kong

#### RESEARCH VESSEL REPLACED BY TRAWLER-TYPE VESSEL:

The Fisheries Research Unit of the University of Hong Kong was established as a subdepartment of the Department of Biology in September 1952. The Unit's

### Hong Kong (Contd.):

research vessel, the Alister Hardy, after five years of service with the Unit, was replaced early in 1960 by the research trawler Cape St. Mary (238 gross tons and 130 feet). The replacement vessel is equipped with biological and chemical laboratory accommodations, and berths for three scientists. She has echo-sounder, radar, and radio transmitter and receiver. The vessel's program includes a trawling, hydrological, and plankton survey of the continental shelf between the Gulf of Tongking and the south coast of Tawain.



### Iceland

#### AMNESTY FOR PAST VIOLATIONS OF 12-MILE FISHING LIMIT GRANTED:

On April 29, 1960, the President of Iceland, upon the recommendation of the Minister of Justice, proclaimed an amnesty for past violations of the unilaterally-imposed 12-mile fishing limit around Iceland. Following on the heels of the British decision not to send warships within the 12-mile zone, the announcement was received in Iceland with hope that these conciliatory moves would avoid a further crisis. The Icelandic amnesty had the effect of absolving United Kingdom trawler captains of charges of fishing inside the 12-mile limit which have accumulated since Icelandic regulations became effective September 1, 1958.

The purpose of the amnesty is to allow foreign trawlers to seek shelter inside the 12-mile limit or to make emergency calls at Icelandic ports without threats of arrest for past offenses. (United States Embassy, Reykjavik, May 6, 1960.)

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#### FISHERY LANDINGS IN 1959 ESTABLISH A NEW RECORD:

Icelandic fishing vessels' over-all landings during 1959 amounted to about 100 tons per fishermen employed in the industry. It totaled 556,200 metric tons, an increase of 10 percent over 1958.

Prior to 1959, the landings in 1958 had established a new record. There were, however, some significant changes, says the annual economic report on Iceland for 1959, issued by the Board of Trade in London.

The report reveals that a drop of 23 percent in the trawler catch was due to Iceland's 12-mile fishing limit under which Icelandic trawlers are barred from fishing inside 12 miles--except for a short period--in limited areas.

The effect of the limitation became fully apparent during the spring fishing and at the time when fishing is usually at its best in March and April. The Icelandic trawler landings were one-third below normal while the small boat landings unaffected by the 12-mile limit increased by 13 percent. The landings of herring during the year rose by 70 percent, but this species is mainly caught by small boats.

While the catch by Icelandic trawlers fell by 23 percent, the small boat catch rose by 31 percent. During the year the trawlers had much less success in their fishing for ocean perch off Newfoundland. The catch of cod by trawlers was 41.5 percent less than in 1958, the smallest catch of this species by Icelandic trawlers for many years. In part, the lower catch of cod was due to the time taken up in sailings to the Newfoundland ocean perch fishing grounds where the yield hardly justified the effort involved.

The report estimates the value of Iceland's fish exports last year at around £25 million (US\$70 million), or some £77,000 (\$215,600) less than in 1958. "The fall in value was due partly to difficulties in disposing of salt fish, and of fish meal and oil which now face severe competition from Peruvian supplies. There was also an increase in value of unsold stocks during the year," the report reveals.

At the beginning of 1959 unsold stocks were estimated at about £5½ million (\$15.4 million), and this figure had risen by some £2 million (\$5.6 million) by the end of the year.

The Icelandic fishing fleet increased by a total of 17 vessels during the year

## Iceland (Contd.):

and now consists of 43 trawlers, 61 fishing vessels of over 100 tons, 619 vessels of under 100 tons; and 42 other smaller craft, total tonnage 117,528. Ten of the new vessels added were 250-ton trawlers from East Germany.

"Next year five new large trawlers will be delivered, mainly from yards in West Germany, and there will also be quite a large addition to the boat fleet of some 40 vessels. These have mainly been ordered to replace older wooden fishing vessels," the report added.

The report states that some 800 Faroese seamen were employed on Icelandic vessels during the 1959 season, but for the 1960 season the Faroese have refused to take employment in Icelandic fishing vessels unless special wage terms are granted to compensate for the devaluation of the Icelandic krona.

There is now a general shortage of seamen for the fishing fleet, especially on trawlers.

Landings in 1959 included 226,400 metric tons of cod, 183,000 tons of herring, 98,800 tons of ocean perch, and 18,000 tons of haddock. (Fishing News, April 1, 1960.)

Note: See Commercial Fisheries Review, June 1960, p. 46.

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#### FISHERIES TRENDS AS OF MID-MAY 1960:

With Iceland apparently embarked on a third consecutive good fishing year and with reason to anticipate victory in the 12-mile fisheries dispute with Britain, cautious optimism is being voiced in fishery circles. This is primarily a short-range view based on the following:

1. The spring cod season neared its close with predictions that it would even exceed last year's good catch.
2. Large schools of herring were sighted in Faxa Bay, which appeared to herald a fine spring herring season.
3. If a bill now in Parliament passes, drag-net fishing for flounder will be permitted in specific areas within the 12-mile limit.
4. The British Trawler Owners Association decided to keep its vessels outside the Icelandic 12-mile limit for at least three months pending possible settlement of the dispute.
5. Despite deliveries of new vessels this spring, the fisheries were not hampered to the extent feared by manpower shortages. Perhaps 200-300 Faroese seamen participated in the fisheries.

The Government's resolution of the export tax question May 6 led to speedy settlement of the long-deadlocked fish-pricing problem.

Although the February 20 Economic Act imposed a 5-percent tax on all exports, uncertainty as to its termination date had complicated efforts to reach a fish price to be paid boat owners by the processors. The processors had urged both a cut in the tax and its early termination to ease their competitive position abroad. The Government cut the export tax to 2-1/2 percent and will probably terminate it by the end of the year.

Thereupon the negotiators reached a price of Icelandic kronur 2.63 per kilogram (3.1 U. S. cents a pound) on line fish and 2.53 per kilogram (3.0 U. S. cents a pound) on gutted net fish for the February 15-May 20 season.

In line with recent efforts to step up the quality of fish products, the Government had encouraged the setting of a higher price differential as between line fish and net fish. The small difference is about the same as last year's, however.

On May 12 a bill for limited drag-net fishing had its first reading in the Parliament. The bill would provide for licensed drag-net operations for flounder within certain areas inside the 12-mile fisheries limit. The yearly period involved would be from June 15 to October 31. These operations generally would be confined to boats of 35 tons or less and permits would be valid only for one season.

The bill would amend acts passed in 1937 and 1948 respecting control of drag-net fishing and is not directly related to the trawler 12-mile limit dispute with Great Britain. However, the manner in which Iceland controls flounder fishing within these limits, will reflect on the general efficacy of the country's fish conservation methods. Critics of the present bill allege it is not based on scientific fish conservation procedures. (United States Embassy report from Reykjavik, May 16, 1960.)



#### India

##### EXPORTS OF FISH AND SHELLFISH FROM COCHIN, 1956/57-1958/59:

All of the frozen shrimp exported from South India to the United States is shipped via the port of Cochin. Shrimp exports from this port are included under the category "fish and prawns." Exports to the United States under this classification in fiscal year 1958/59 (July 1-June 30) amounted to 1,351 short tons valued at US\$1,119,000, as compared with only 505 tons valued at \$509,000 in fiscal 1957/58 and 595 tons valued at \$495,000 in fiscal 1956/57. Exports to the United States of fishery products other than frozen, dried, or canned shrimp, and spiny lobster tails are negligible. In addition, India also exports some frog legs to the United States which are probably not included in India's statistics on exports of "fish and prawns."

All four South Indian states (Kerala, Andhra Pradesh, Madras, and Mysore)

## India (Contd.):

Exports of Fishery Products from Cochin (India), 1956/57-1958/59								
	Quantity			Value				
	1959/58	1958/57	1957/56	1959/58	1958/57	1957/56	1,000 Rupees	1,000 Rupees
Total . . . . .	4,767 1,351	(Short Tons) 505	5,144 595	14,733 5,304	3,109 1,119	14,933 2,412	3,151 509	12,414 2,345
To United States . . . . .								2,619 495

have programs for fishery development. The implementation of these programs for expansion of fisheries should result in greater landings. (United States Consulate, Madras, April 18, 1960.)

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#### EXPORTS AND IMPORTS OF FISHERY PRODUCTS, 1959:

Exports of fishery products by India in 1959 amounted to 61.1 million pounds, valued at about US\$12.9 million. Principal countries of destination were Ceylon, Singapore, United States, and the United Kingdom.

valued at about \$1.4 million (exclusive of frog legs, which according to United States Customs records amounted to 182,000 pounds in 1959). Exports to the United States included 2,393,000 pounds of shrimp, 62,000 pounds of canned shellfish (mostly shrimp), 541,000 pounds of unclassified canned fish, and 153,000 pounds of other shellfish (presumably spiny lobster tails). Other items exported to the United States amounted to about 7,000 pounds and probably consisted of Oriental specialty items. Exports of fishery products to the United States made up 4.4 percent of the total quantity exported and

Product	Quantity		Value			
	To U. S.	All Countries	To U. S.		All Countries	
			1,000 Lbs.	Rupees <sup>1</sup>	US\$	Rupees <sup>1</sup>
Fish and shellfish other than canned:						
Fresh fish (live or dead) . . . . .	3	90	5,441	1,145	75,244	15,841
Fish, not salted . . . . .	-	3,407	-	-	569,664	119,929
Fish, dried, salted, or smoked . . . . .	2	50,650	1,830	385	40,659,888	8,559,976
Shark fins and other . . . . .	-	623	-	-	1,898,716	399,730
Crustacea (except shrimp) . . . . .	153	159	289,075	60,858	324,191	68,251
Shrimp . . . . .	2,235	11,598	4,675,261	984,265	15,090,285	3,176,902
Total fish and shellfish other than canned	2,393	66,527	4,971,607	1,046,653	58,617,988	12,340,629
Canned fish:						
Shellfish . . . . .	62	63	188,047	39,589	189,210	39,834
Canned fish other than sardines . . . . .	541	750	1,357,686	285,829	2,106,445	443,462
Sardines and pilchards . . . . .	-	4	-	-	19,830	4,175
Other . . . . .	-	3	-	-	8,190	1,724
Total canned . . . . .	603	820	1,545,733	325,418	2,323,675	489,195
Other products (not canned) . . . . .	2	445	5,000	1,053	116,669	24,562
Total all products . . . . .	2,998	67,792	6,522,340	1,373,124	61,058,332	12,854,386
1/4.75 Rupees equal US\$.1.						

Imports of fishery products by India in 1959 totaled 34.3 million pounds, valued at US\$6.1 million. Imports from East and West Pakistan made up about 70 percent of the total imports in 1959.

In 1958, India's exports of fishery products were close to 64.3 tons, valued at \$12.2 million; imports totaled 24.3 million pounds, valued at \$4.3 million.

The United States share of India's export trade in fishery products in 1959 amounted to about 3 million pounds

10.7 percent of the value of all fishery exports. (United States Embassy, New Delhi, May 11, 1960.)



#### Indonesia

##### SHRIMP FISHERY UNDEVELOPED:

Although there are no Indonesian statistics on shrimp landings, observers have reported the presence of substantial shrimp resources in Indonesian waters,

**Indonesia (Contd.):**

both small shrimp in coastal waters and large shrimp farther out to sea. However, no facilities exist to market efficiently the light landings of shrimp. Nor are there facilities for increasing the catch. There are no foreign companies engaged in shrimp fishing in Indonesia.

It is estimated by the International Cooperation Administration Fisheries Advisor that approximately one-half of the shrimp catch is for immediate use and that the remainder is sold commercially. Shrimp is readily available in restaurants. The Fisheries Advisor estimates that more than one million pounds of shrimp per month could be produced if the facilities were available. However, nothing is presently being done to develop or assist the commercial development of the Indonesian shrimp resources. (United States Embassy in Djakarta, May 9, 1960.)

**Japan****ALBACORE TUNA LANDINGS AT PORT OF YAIZU:**

On May 21, 1960, the port of Yaizu, Japan, had albacore landings of 130 metric tons, the highest yet registered this season at that port or at the other principal Shizuoka Prefecture bait-boat port of Shimizu. Despite research agencies' predictions that summer albacore fishing would be good this year, fishing has been slow in getting started, and both Yaizu and Shimizu daily albacore landings have not previously risen above the 100-ton mark.

After three consecutive poor seasons, the good landings on May 21 aroused hopes of a good season.

In May the best fishing grounds were around Torishima, where some boats were reported to have taken as much as 20 tons of albacore. About 40 boats landed fish on May 21, and prices were US\$350 a short ton for large albacore and \$345 for medium fish. (The Suisan Keizai, May 22, 1960.)

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**FROZEN TUNA EXPORTS,  
APRIL 1, 1959 TO MARCH 31, 1960:**

Japanese exports of frozen tuna in the 1959 export year (April 1959-March 1960), according to the Ministry of International Trade and Industry, were as follows (figures in parentheses are for the 1958 export year):

To the United States and Canada: albacore by freighter from Japan--24,818 tons (27,195 tons); albacore by transhipment--4,406 tons (960 tons); yellowfin shipped from Japan--31,285 tons (48,360 tons); yellowfin by transhipment--11,874 tons (8,364 tons). To Italy--12,835 tons (11,624 tons). To Yugoslavia--8,655 tons (none). To other European countries--8,583 tons (70 tons). Big-eyed tuna--611 tons (3,432 tons). Skipjack--1,111 tons (2,753 tons). Total--104,206 tons (103,642 tons). (The Suisan Tsushin, May 20, 1960.)

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**TUNA MOTHERSHIPS SAIL FOR FISHING AREAS:**

The first Japanese tuna mothership to sail for the fishing grounds this year was the No. 3 Tenyo Maru, which departed from Tokyo on May 3, 1960. The second was the Nojima Maru (8,504 tons gross) which sailed from Kobe on May 18 for the Fiji Islands area.

The Nojima Maru fleet comprises 46 fishing boats (including 2 scouting boats), the earliest of which sailed for the fishing grounds in the first part of May. The fleet will rendezvous and begin operations off Fiji. Plans call for production of 5,700 metric tons of frozen fish, a slight increase over last year's 5,500 tons.

This year a total of five fleets will carry on mothership-type tuna fishing. In the grounds north and south of Fiji, the No. 3 Tenyo Maru will be replaced in August by the Tenyo Maru, which is at present fishing in the Bering Sea and processing fish meal.

This year the three companies that have been engaged in the mothership tuna fishery asked the authorities for an expansion of the fishing area, permission to use portable catcher boats, and an increase in the catch quota, but their requests were denied and the mothership-

## Japan (Contd.):

type tuna fishery is to continue under the same regulations as in the past. However, the Government's policies for this fishery are scheduled for a change after the end of this year. (The Suisan Keizai, May 20, 1960.)

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PLAN TO INTRODUCE SALMON  
IN SOUTH AMERICA:

A Japanese Diet member has advanced the idea of seeking a way out of the gradual cutting back of Japan's North Pacific salmon fishery by developing the waters around South America. He has already sounded out the opinions of South American governments on this scheme.

The plan has advanced to where the Diet member will soon make a trip to South America with a party of Hokkaido legislators to study conditions there. The schedule for the trip is not yet decided, but the idea is to have a member of the staff of the Japanese Fishery Agency accompany the party, and to center the investigation on the rivers of Chile. (The Suisan Tsushin, May 21, 1960.)

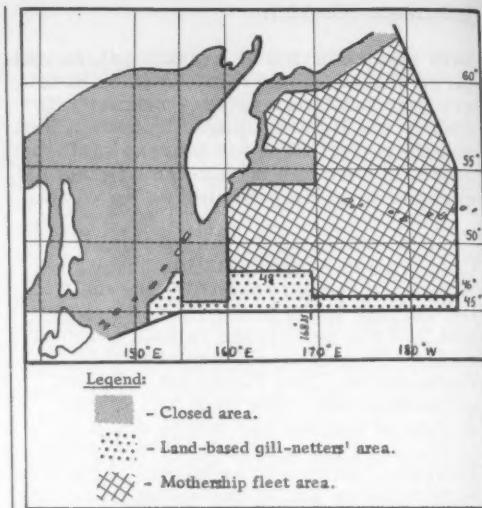
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NORTH PACIFIC SALMON  
FISHERY TRENDS:

Japan's 12 salmon mothership fleets sailed for the North Pacific fishing grounds May 19, 1960. The licenses distributed before the fleets sailed had provisionally been made out for 100 tons a catcher boat.

The land-based fishermen who operate south of 48° N. latitude made strong representations to the authorities to increase their share of the total catch quota as compensation for their having had new closed areas established in their fishing grounds by the Japanese-Soviet Commission for Northwest Pacific Fisheries at this year's meeting in Moscow. The Japanese authorities found it difficult to take this step, and so they issued provisional licenses. On the other hand, the mothership operators claimed that in the past three years' settlements they have been on the short end, their operating areas having been more and more restricted without any change in the ratio of allocation of the catch quota. Pointing out that the land-based fishermen can operate freely south of the treaty area, the mothership operators claim that the demand for a reapportionment of the quota is unfounded and absolutely unacceptable. The quota of 67,500 metric tons was divided as follows: the mothership fleets were assigned a quota of 54,000 tons and the land-based gill-netters a quota of 13,500 tons. The land-based gill-netters got a higher share than in the past—a 4 to 1 ratio instead of the traditional 5 to 1. In addition, the land-based fishermen, to compensate them for the new closed areas near Hokkaido, got a piece of the mothership operating area, at approximately 46° N. to 48° N. latitude, 185° E. to 189° E. longitude.

Salmon gill-netters and long-liners operating east of Hokkaido were finding the schools and having good fishing



Japanese North Pacific salmon fishing areas for 1960.

In May 1960. The grounds are about 140-150 miles east of Hanasaki, along 41° N. latitude. The fish were smaller than in the average year, and red salmon fishing was good. The price was also good, because of the delay in beginning salmon mothership operations caused by the Japan-Soviet fishery negotiations. Aside from the specially high price at the time fishing began April 22, the prices at Kushiro have been about 20 percent higher than last year's. On May 13 landings were 215 metric tons and on the 14th 240 metric tons. The entire land-based fleet was operating with 340 fishing vessels.

Pink-salmon fishing on the Japan Sea side moved north in Hokkaido waters in May, and 230 Hokkaido boats were fishing there. About 100 tons a day were being landed, and the ports were suffering a shortage of freight cars.

The salmon fleets sailed four days later this year than last. Some fishermen complained that because of the delay they would miss the high-priced red salmon.

The Japanese catch quota for 1960 agreed on at the Moscow meeting was 67,500 metric tons, as compared with 85,000 tons last year. Within the quota the red-salmon quota is 15,500 tons, estimated as 7,750,000 fish. Last year it was 16,000 tons or 8 million fish. Once again, not more than 2.5 million of the red salmon are to be caught west of 165° E. longitude.

At the Moscow meeting it was also decided that in 1960 the existing areas within the convention area, in which the capture of salmon on the high seas by movable fishing gear is prohibited, will be continued as last year. Furthermore, in order to protect the pink-salmon resource of the west coast of Kamchatka, this year only there will be a cessation of the capture of salmon by movable gear in the two zones within the convention area south of 48° N. latitude. Of the total number of drift nets used in the salmon fishery in 1960, not less than 25 percent shall have meshes measuring 65 mm. from knot to knot.

In addition, in order to protect the crab resource, commercial fishing for crab will not be carried on in 1960 in several areas adjacent to the west coast of Kamchatka, and certain other measures will be taken.

The Commission has agreed on policies for joint scientific investigation of salmon, crab, and herring. The necessity for an exchange of fishery experts in 1960 has also been recognized and recommendations have been made to the contracting parties to implement such exchange.

## Japan (Contd.):

The Commission's fifth meeting will convene on January 23, 1961, at Tokyo. The Commission ratified the Protocol of its fourth meeting on May 18, 1960.

According to an official message from the Japanese Ministry of Foreign Affairs to the Ministry of Agriculture and Forestry, the details of the areas newly closed to Japanese salmon fishing in the North Pacific in 1960 are as follows:

A rectangular area bounded by  $45^{\circ} 51' N.$  and  $48^{\circ} N.$  latitude,  $155^{\circ} E.$  and  $160^{\circ} E.$  longitude; and a triangular area between the boundary of the convention area and  $151^{\circ} 30' E.$  longitude. (*The Suisan Keizai*, May 21; *Nippon Suisan Shimbun*, May 23; and *Nippon Keizai Shimbun*, May 19, 1960.)

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## TWO WHALING FLEETS SAIL FOR NORTH PACIFIC:

The Japanese 14,000-ton whaling factoryship *Kyokuyo Maru* sailed for the North Pacific from Yokohama on May 21, 1960, with 10 catcher boats. The fleet, jointly operated by three Japanese fishing companies, is scheduled to reach the whaling grounds on May 27 and to continue operating until September. In addition to the factoryship and catcher boats, the fleet also includes 3 refrigerator ships, 6 carriers, and a tanker. Production plans call for a catch of 70 blue whales, 1,420 fin whales, and 120 humpback whales (800 blue-whale units in all) and 200 sperm whales. These are expected to yield 12,000 metric tons of baleen oil, 18,080 tons of frozen whale meat, 800 tons of salted whale products, 48 tons of whale-liver oil, and 5 tons of other whale products; 1,700 tons of sperm oil, 500 tons of frozen sperm whale meat, 6.8 tons of sperm whale-liver oil, and 141 tons of salted and other sperm whale products.

On May 20 the No. 2 *Zunan Maru* (13,000 tons gross) sperm-whale fleet, jointly operated by five Japanese companies sailed from Kobe for the North Pacific. Besides the factoryship, the *Zunan Maru* fleet comprises 7 catcher boats, a refrigerator ship, and 2 carriers; this fleet will also be served by the same tanker as the *Kyokuyo Maru* fleet. The fleet will operate from May 28 to August 10 and will return to Japan August 18. It plans to catch 1,600 sperm whales (average length 45 feet), and produce 12,512 metric tons of oil, 3,520 tons of refrigerated meat, 1,088 tons of salted

meat, 53.5 tons of liver oil, and 4.8 tons of teeth. (*The Suisan Tsushin*, May 21; *The Suisan Keizai*, May 22, 1960.)



## Mexico

## SHRIMP EX-VESSEL PRICE WAR AT CAMPECHE AND CARMEN:

Another increase in shrimp ex-vessel prices on April 18, 1960, the fourth since April 2, marked the continuance of the price-war that has been going on in Carmen and Campeche, Mexico, for about two months. The price war, originating in Carmen, had had its influence on ex-vessel prices in Campeche and to a lesser extent in Salina Cruz. It is reported to be a struggle between two companies over control of the Carmen shrimp fleet.

The struggle, coming at this time, has been viewed with considerable apprehension by the rest of the shrimp companies in Mexico since they feared it might affect their position during the price negotiations with the cooperatives. Only members of fishery cooperatives are permitted to catch shrimp in Mexico, but only a small fraction of the shrimp fleet is owned by the cooperatives. Consequently, each year the boat owners collectively negotiate with the cooperatives over the ex-vessel price to be paid for the shrimp. The negotiations, under government supervision, were scheduled to begin on May 15 this year.

Price increases since April 2, 1960, reportedly have been restricted to Carmen and Campeche. Salina Cruz prices are reported not to have increased.

At Carmen and Campeche, between April 2 and April 18, ex-vessel prices, for certain sizes, increased by as much as 7 U. S. cents a pound for the 21-25 and 26-30 count and 3 U. S. cents a pound for sizes larger than 21 count to a pound. The same price is being paid for all varieties of shrimp at Carmen and Campeche. (United States Embassy dispatch from Mexico, April 19, 1960.)

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**Mexico (Contd.):****FISHERY TRENDS FOR YUCATAN PENINSULA:**

**State of Yucatan:** Fishery products taken from the waters off the State of Yucatan (located in the northern part of the Peninsula of Yucatan) are primarily fish such as the grouper, rather than shellfish. Few shrimp or spiny lobster are found. Catches which enter commercial channels are generally sold to a cold-storage plant at Progreso. Others are sold locally as fresh fish, especially when brought ashore at small ports at some distance from Progreso. Problems which have retarded the Yucatan industry are the absence of refrigeration facilities and the use of small boats which are limited to fishing in good weather near shore.

The Yucatan Governor's 1960 program envisages the organization of the industry, the construction or acquisition of larger boats, experimentation with refrigerated vessels, and the construction of refrigerating plants in small ports, especially Sisal, Chetumal, Chuburna, and Telchac Puerto. The Governor predicts that a daily catch of 50 tons could be realized with larger boats and an organized industry. An obstacle to the refrigeration plants is the absence of electricity.

**State of Quintana Roo:** The waters off Quintana Roo from Isla Mujeres south to Chetumal apparently contain a considerable amount of spiny lobster judging from reports. There are several fishing cooperatives operating out of Chetumal and commercial landings of spiny lobster, reportedly, could be profitable both on the island of Cozumel and at Isla Mujeres if the problems of refrigeration and transport could be solved. Despite the interest of the Governor of Quintana Roo in the development of the industry, including the construction of cold-storage plants and exportation, foreign investments are risky. The current lobster season ended on March 15, states an April 25, 1960, report from the United States Consul in Merida.

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**POSTPONEMENT OF SHRIMP FISHERMEN'S PRICE NEGOTIATIONS PROBABLE:**

Although official announcement has not yet been made, it is probable that negotiations between the Mexican fishermen's cooperatives and vessel owners concerning the price to be paid fishermen for 1960/61 shrimp landings will be postponed for three months. The 1959/60 contract expired on May 15, 1960, and normally negotiations would begin on that date. However, the Government has asked for, and the National Chamber of the Fishery Industry has agreed to, a three months' postponement. As of May 10, the Chamber had not received confirmation of the postponement, but reliable sources believed the present contract probably will be extended. The purpose of the postponement is to provide more time for the Government to study the industry in all its aspects.

Shrimp fishing in Mexico is reserved for the fishermen's cooperatives. By far the greater portion of the trawl fleet is owned by persons other than the fish-

ermen. The price the vessel owners pay the fishermen's cooperatives is fixed by a negotiated contract. The negotiations are held under governmental supervision.

In the past, separate negotiations have been held at different times and different contracts have been signed for the Gulf of Mexico and for the Pacific Coast fisheries. This year, though different contracts eventually may be signed, the negotiations for both the Pacific and the Gulf will be held jointly. (United States Embassy, Mexico, May 10, 1960.)

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**SHRIMP FISHERY TRENDS:**

**March 1960:** Higher shrimp ex-vessel prices, the settlement of the Guaymas boat lay-up, and the U. S. Tariff Commission hearings on the effect of shrimp imports in the United States industry were the principal items of interest to the Mexican shrimp industry in March. Landings and exports were about the same in March 1960 as in the same month of 1959.

During March ex-vessel prices rose 6-8 U. S. cents a pound at the Gulf of Mexico's port of Carmen and 7-11 U. S. cents a pound at Salina Cruz on the West Coast. Price increases reflect both an improved market and a local price war centered about Carmen-Campeche and carried over to some extent to Salina Cruz. At the end of the first week in April ex-vessel prices were:

Size (No. Per Lb.)	Shrimp Ex-Vessel Prices at East and West Coast Mexican Ports, April 4-9, 1960	
	At Ciudad del Carmen White, Brown & Pink	At Salina Cruz Brown White
Under 15 . . .	70	55 57
15/20 . . .	65	53 55
21/25 . . .	55	43 45
26/30 . . .	50	39 39
31/35 . . .	47	- -
31/40 . . .	-	37 37
36/40 . . .	39	- -
41/50 . . .	34	32 32
51/60 . . .	29	- -
51/over . . .	-	27 27

After about two months of inactivity the Guaymas shrimp fleet put out to sea on March 20. The price dispute was settled on March 19. Reports indicate that mostly brown shrimp were being landed at Guaymas.

Salina Cruz landings also were mostly brown shrimp. At Carmen landings

## Mexico (Contd.):

were over 60 percent whites during the first half of March, but during the last half there was a shift to a preponderance of pinks. Campeche landings ran about 90 percent pinks and most of the remainder were whites.

A succession of northerly winds kept Gulf of Mexico landings down in March. Carmen landings averaged less than 600 pounds-per-trip during the first three weeks. The last week of March showed average landings of more than double that amount. Campeche landings ran about 850 pounds per trip until the last week when they rose to over 1,200 pounds-per-trip.

The white shrimp landed at Carmen were of good size, about two-thirds were 30 count and under. Most of the pinks were 31 count and over. About 65 percent of the Campeche landings were 30 count and under.

The National Chamber of the Fishery Industry sent two representatives to Washington to testify before the U. S. Tariff Commission in opposition to proposed legislation for import duties and quotas on shrimp. (United States Embassy in Mexico City, April 19, 1960.)

April 1960: The opening of a new shrimp-breading plant and rising ex-vessel prices in the Gulf of Mexico ports of Carmen-Campeche were developments of interest in the Mexican shrimp fishery during April. Shrimp landings and exports in April were reported at a level slightly above those of April 1959.

A shrimp breading plant started operating in Salina Cruz on Mexico's west coast the last of April. This makes two such plants for Mexico. The first plant is located in Coatzacoalcos, Veracruz. When the new plant is in full production Mexico will have a daily capacity (one eight-hour shift per day) of between 9,000 and 10,000 pounds of breaded shrimp (finished product).

Shrimp ex-vessel prices in April continued to rise at Carmen and Campeche due to a local "price war." There

were no changes in Salina Cruz ex-vessel prices in April.

Size (No. Per Lb.)	Shrimp Ex-Vessel Prices at East and West Coast Mexican Ports, as of May 10, 1960		
	At Carmen-Campeche White, Pink, & Brown	At Salina Cruz Brown	At Salina Cruz White
Under 15 . . . . .	80	55	57
15/20 . . . . .	72	-	-
16/20 . . . . .	-	53	55
21/25 . . . . .	67	43	45
26/30 . . . . .	62	39	39
31/35 . . . . .	57	-	-
31/40 . . . . .	-	37	37
36/40 . . . . .	47	-	-
41/50 . . . . .	42	32	32
51/60 . . . . .	35	-	-
51/over . . . . .	-	27	27

As customary at this time of year, Salina Cruz landings were reported to be dropping off. With some improvement in weather, Carmen-Campeche landings averaged somewhat higher than during March. Carmen boats averaged about 800 pounds of shrimp tails per trip and Campeche about 950 pounds in April.

Carmen shrimp species composition shifted from about 80 percent pink the first week of April to about 50 percent white the next two weeks and to about 60 percent brown during the last week. Size composition also shifted from about 70 percent 31 and over the first week to about 60 percent 30 and under the following two weeks and to about 60 percent 31 and over the last week.

Campeche landings also varied in species and size composition although not as widely as at Carmen. The first week about 90 percent of the landings were pink and 10 percent white, running about 75 percent 30 and under count. The second week they ran about 80 percent pink and 20 percent white with a few browns. The sizes dropped to about 50 percent 30 and under. The third week they ran about 70 percent pink, 20 percent brown, and 10 percent white, with about 60 percent 30 count and under. The last week they were about 85 percent pink, 10 percent white, and 5 percent brown, with about 75 percent 30 count and under. (United States Embassy, Mexico, May 11, 1960.)

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#### VERACRUZ AREA MACKEREL FISHERY TRENDS:

The mackerel fishing season covering the first quarter of 1960 and part of

**Mexico (Contd.):**

April proved to be more profitable to Veracruz area fishermen this year than last. They obtained higher prices--between 1.90 and 2.20 pesos a kilogram (6.9-9.0 U. S. cents a pound), and sold more fish.

The higher prices are due to the fact that the purchasing monopoly which was plaguing the fishermen and keeping prices low has now disappeared, at least temporarily.

The larger quantity of fish sold may be partly due to a campaign which was carried on by the Mexican Government for cheaper fish. Increase of sales to Mexico City was particularly noted. (United States Consulate report from Veracruz, April 26, 1960.)

**Morocco****FISHERIES TRENDS,  
FIRST QUARTER 1960:**

The first quarter of the year is not a particularly active time for the Moroccan fishing industry, but during the period exports continued at a high level, the canned sardine export quota for the next year and a half was set, and the Marine Fishing Institute increased its activities. Preliminary figures show a total catch very slightly below that of the 1958 season. However, the export of canned fish so far this season (from June 1959 through May 1960) as of the end of March is better than in the last 10 years except for the banner year of 1957. Sales of canned sardines are holding up well, being about the same as the average for the last ten years. Tuna and other canned fish exports bring the totals up. Figures for January this year show better sales than normal.

With the encouragement of these good sales, canned sardine export quotas were raised. A committee of Government and private representatives met in February, and the decision was made to export 230,000 more cases this season and to set the quota at 1,900,000 cases for the 1961 season. Both these figures represent increases over the last year and will require strenuous efforts to fulfill.

In conjunction with this heightened optimism, activities were intensified in the Marine Fishing Institute with the help of additional personnel detached from the corresponding French institute. Continued efforts are being made to use electrical fishing apparatus in the particularly salty Moroccan waters. Success has been reported in research on an inexpensive sardine paste, and work continues on the improvement of fish meals and flours.

Unofficial figures on the 1959 landings indicate a total of 355.8 million pounds. Landings included 201.2 million pounds of sardines, 55.5 million pounds of mackerel, 3.1 million pounds of spiny lobster, 94.6 million pounds of other inshore and offshore fish, and 1.4 million pounds of other shellfish.

Discussions took place between representatives of all segments of the Moroccan fishing industry at a meeting of the Central Committee of Fishing in Casablanca from April 13-15, 1960. Recommendations were made for the construction of small boats for coastal fishing and for the creation of a Moroccan fleet for deep-sea fishing. Priority of purchase was urged for fresh fish for internal consumption in conjunction with the campaign for increased domestic consumption of fish and fish products. Commissions were formed to study modernization and commercialization. (United States Embassy in Rabat, April 18, 1960).

**Netherlands****ANTARCTIC WHALING EXPEDITION  
COMPLETEES 1959/60 SEASON:**

The management of the Netherlands whaling company has announced that the expedition headed by its 26,830-ton factoryship *Willem Barendsz* ended operations on April 15, 1960. Total production for the 1959/60 season was 26 percent higher than during the 1958/59 season.

Whale Products Produced by Netherlands Whaling Fleet in Antarctic, 1958/59 and 1959/60 Seasons

Product	Seasons	
	1959/60	1958/59
Whale oil . . . . .	. . . (Metric Tons) . . .	23,505 18,663
Liver oil . . . . .	11	12
Meat meal . . . . .	4,711	3,696

The management stated that it was satisfied with the total catch, even though the daily output was disappointing, as the catch season comprised 122 days compared with 69 days for the 1958/59 season.

The entire whale oil output for the current season has reportedly been sold at £72.5 (about US\$203) per long ton (2,240 pounds) to a British firm. This is the same price at which the whale oil was sold during the previous season and in view of the present lower price level on



**Netherland (Contd.):**

the international whale oil market, it was better than expected. The price paid by the British firm for the Dutch whale was the same as that paid for Norwegian oil.

The Netherlands whaling company recently concluded a contract with a large Japanese fisheries company for the delivery of whale meat at a price of fl. 100 (US\$26.53) per metric ton (about 1.2 U. S. cents a pound). The Netherlands company will be able to deliver about 6,000 tons of whale meat to the Japanese firm per year. The Japanese firm will shortly have a freezing installation available and will process the whale meat into pet food and expects to sell these products to a British firm at a price of fl. 700 (\$185.68) a metric ton or close to 8.4 U. S. cents a pound.

Since the production of whale products exceeded 20,000 tons during the 1959/60 season, the Netherlands whaling company, in accordance with an agreement with the Netherlands Government, will pay a six percent dividend this year, according to an April 27, 1960, dispatch from the United States Consulate in Amsterdam.

*Note:* Also see Commercial Fisheries Review, June 1960, pp. 53 and 57

**Norway****COD FISHERY TRENDS, MAY 1960:**

North Norway's annual Lofoten cod fishery, largest of its kind in Europe, gave poor results this year. When the 1960 season closed in April, after nearly three months of hectic activity, fishermen had landed a total of 37,387 metric tons of cod. This was 6,790 tons less than last year and only about 3,000 tons more than in 1958, the worst Lofoten season in this century. Landings in the past decade have averaged about 55,000 tons a year, while the average number of fishermen was nearly twice as large as in 1960. At the peak of the 1960 season, 9,766 fishermen were engaged in the Lofoten fishery. The average, however, was only 5,683 men in 1,683 fishing craft, the lowest ever recorded.

Prospects seemed bright when the Government fishery inspectors went to work on January 31. Reports indicated that large shoals of mature cod were approaching the Lofoten Islands. And the cod did show up, but most of the time the fish were too low in the water to be readily caught by drift nets. Line fishermen and jiggers made out better. Purse-seiners were banned from Lofoten for the second year in a row.

The inspection service in Lofoten covers the 116-nautical-mile stretch from Risvær in the east to Røst in the west. The chief of the district and his 60 assistants have

full police authorities while the season lasts. Conditions in ports and on the banks are checked throughout each day, partly by cruising around in the eight speed boats at the disposal of the inspection service.

The Lofoten fishery is conducted according to fixed rules, some of which date back to the 18th century. Vessels depart for the banks and return to port at a certain hour of the day, with special signals for coming and going. Inspection vessels follow the fleet both ways. Night fishing is not permitted, and Sunday is a day of rest. On the banks, inspectors make certain that drift-netters and long-liners stay within their allotted strips of water without encroaching on each other. Jiggers are free to fish anywhere they please.

Fishermen must observe stringent Government regulations for handling their catch. As soon as the cod are hauled aboard, they must be bled to keep the meat white. Then, they must be gutted to prevent bacterial growth. Finally, the fish must be thoroughly washed while still at sea.

When the cod (bled, gutted, and washed) are delivered to filleting and freezing plants ashore, inspectors are on the job to check quality, packaging and weight, visiting each plant at least once a day. Strict government regulations require that only fish which were alive when regaled may be used for filleting. The code of procedure also stipulates the method of filleting and freezing, types of packing, and modes of transportation. The inspectors who enforce this code work directly under the Norwegian Directorate of Fisheries.

Only a fraction of the total Norwegian fish catch which in 1959 was 1,369,685 tons, goes to filleting and freezing plants. In 1959, these had a combined production of about 30,000 tons, largely cod fillets. It takes 10 pounds of raw fish to make 4 pounds of fillet, so processing plants consumed altogether some 75,000 tons to achieve the 1959 output.

Most of the Norwegian frozen fish is exported to earn valuable foreign exchange. All but a few of the 30 odd freezing plants in North Norway distribute their products through a jointly-owned sales organization (Norsk Frossen-fisk A/L.) whose fillets and fish sticks are sold in 20 foreign countries. Of the 24,000 tons sold last year, over 20,000 tons, worth Kr. 70 million (US\$979,000) went to foreign customers. The United States, which is Norsk Frossen-fisk's biggest market, took over 8,500 tons.

The second largest producer of frozen fish fillets in Norway (A/S Finndus, Oslo), has its plant at Hammerfest, northernmost town in the world. About 75 percent of the 5,000 tons produced there annually is exported. The principal markets are in Great Britain and Sweden. Under a government proposal, now before Parliament, the North Norway Development Fund would be authorized to guarantee a Kr. 12.5 million (US\$174,825) loan for Finndus to expand its annual plant capacity to 10,000 tons. (News of Norway, May 12, 1960.)

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**GOVERNMENT VOTES AID FOR FISHERMEN:**

The Norwegian Storting on March 14, 1960, appropriated 22 million kroner (US\$3,080,000) for the aid of the herring and cod fishermen during the first half of 1960. The amount will be apportioned as follows: kr. 14.5 million (\$2,030,000) for gear subsidies; kr. 6.0 million (US\$840,000) for support of cod fish prices in North Norway; kr. 1.0 million (\$140,000) for bait subsidies; and kr. 0.5 million (\$70,000) for other aid to the cod

### Norway (Contd.):

fishermen. According to an official of the Ministry of Fisheries, an additional kr. 8 million (\$1,120,000), of which kr. 4 million (\$560,000) is to be used for price supports, will be appropriated later for the second half of 1960.

In 1958 the Storting had appropriated kr. 34 million (\$4,760,000) for the cod fishery, nearly all of which went into price supports. The shift away from price supports to gear and bait subsidies follows a recommendation of the Brofass Committee which had investigated means of increasing the profitability of the fisheries. In view of the size of the price support program in 1958, the Storting determined that it would be inadvisable to discontinue the practice completely in 1960.

The eventual discontinuation of price supports will remove one of the causes of the dispute between the fish filleting and freezing industry and the North Norway fishermen's marketing organization, over the alleged discriminatory policy of the organization in the distribution of the price support funds. The freezing industry has been complaining because the price support funds have been used to support the prices paid by other cod processing industries and not those paid by the freezing industry. The organization maintains that the freezing industry can afford to pay higher prices and does not need any price support funds. (United States Embassy, Oslo, March 18, 1960.)

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### SUPPORTS 12-MILE FISHING ZONE:

Norway's representative to the 88-nation Conference on the Law of the Sea at Geneva declared on March 31 that his country would support the Canadian proposal. This calls for a territorial sea limit of 6 miles, plus an adjacent 6-mile fishing zone from which foreign fishing vessels would be barred. The statement on Norway's position was made before Canada and the United States submitted their joint compromise plan of 6 miles territorial sea plus 6-miles fishing zone with 10-year cut off for those nations with historic rights in the outer six-mile zone.

Norway's representative observed in part: "Our first conference, held in 1958, showed clearly that it would be impossible to reach a general agreement which would give coastal states the right to extend their territorial sea or their fishing zone beyond 12 miles. It was equally clear that a majority of the participating states was against a maximum territorial limit of less than 6 miles. The main conflict of interest was in regard to jurisdiction over the outer zone between 6 and 12 miles. This, therefore, is the point on which we shall have to concentrate our efforts."

"The conference in 1958 demonstrated clearly that the interests of coastal states in regard to fishing extend much farther out than those of so-called noncoastal states. A majority, therefore, supported the idea of providing a wider limit for the fishing zone than for the territorial sea. In my opinion, it would be unwise if this fact were to be ignored by the present conference.

"On the basis of Norway's national interests, we would have preferred a maximum territorial limit of 3 to 4 miles. In our opinion, such an arrangement would also be the best for the world as a whole. We are aware, however, that a majority of the states will not accept a territorial limit of less than 6 miles, and we will, therefore, adhere to the concession we made on this point in 1958.

"As to the fishing zone, I wish to affirm that the Canadian proposal is in accord with the national interests of Norway. Technical developments in deep-sea fishing and the heavy increase in trawlers along the coast of North Norway have created very serious problems for our traditional fisheries. Opportunities for our coastal fishermen to fish in their traditional waters are becoming ever more limited, because their implements are destroyed and their ancient fishing banks wholly or partly occupied by foreign trawlers. People in the coastal districts of North Norway are completely dependent upon these fisheries. The fast growth of the foreign trawler fleet represents a new and threatening factor in their lives. They maintain this necessitates new rules, and the government sees no choice but to provide a 12-mile fishing zone with exclusive rights for the nation's fishermen. To give coastal fishermen a reasonable protection in exploitation of their traditional fishing grounds and use of their traditional implements is, in our view, an equitable way of balancing conflicting interests, not only along the Norwegian coast but in all parts of the world," concluded Norway's representative at the Conference. (*News of Norway*, April 14, 1960.)



### Pakistan

#### PLANS FOR BUILDING NEW TRAWLERS CHANGED:

In December 1959, the Pakistan Government allocated Rs400,000 (about US\$85,000) towards the cost of 14 otter trawlers to be built outside of Pakistan. As of the latter part of April 1960, only one order had been placed.

The Government has now decided to have the trawlers built by the Karachi Shipyard and has reportedly asked the one licensee to try to cancel his order. Licenses are not being revoked, but the 14 licensees are being asked to use the foreign exchange to import components such as engines, refrigeration equipment, and deck gear. An additional 9 firms will be given licenses for the import of such components, according to an April 28 dispatch from the United States Embassy in Karachi.



**Peru****ANCHOVY FISHERMEN****RESUME TIE-UP:**

After a 15-day negotiating period, Peruvian anchovy fishermen at the port of Callao on May 11 resumed the tie-up which began in mid-April and closed fish meal plants in Callao and other ports along the Peruvian coast. During the negotiations, 2 of 4 demands were met--a weekly rest day and increased allowances for meals. However, plant and vessel owners have refused to accord the fishermen a specified percentage of the price per ton for the formation of a fishermen's mutual association, the United States Embassy at Lima reported on May 13, 1960.

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**EXPANSION OF FISHERIES RESEARCH EXPECTED IN 1960:**

Fisheries research by Peru may be expected to gain impetus during 1960, if the program announced during the first quarter of 1960 by the Bureau of Fisheries and Hunting of the Ministry of Agriculture can be carried out. The three-fold program consists of an investigation of ocean resources, particularly bonito, the cultivation of fresh-water fish and crustaceans, and technical studies of quality control of fisheries products.

The Governing Council of the Special Fund of the United Nations has made available to Peru the sum of US\$1,374,300, part of which is to be used for the creation of a Marine Research Institute for the study and development of Peru's marine resources. There has been no indication as yet whether the balance of the United Nations fund will be used for the program announced by the Ministry, states an April 12, 1960, dispatch from the United States Embassy in Lima.

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**EXPORTS OF FISHERY PRODUCTS, 1958-59:**

Exports of frozen fish and shellfish, canned fish, and fishery byproducts by Peru in 1959 increased for all items except shrimp. Total exports of all fishery products increased by 140 percent in quantity and 152 percent in value as compared with 1958. Fish-meal exports of 277,600 metric tons in 1959 were up about 162 percent from the 105,777 tons exported in 1958. The more than tenfold jump in the exports of fish oil

Product	Peru's Principal Fishery Products Exports, 1958-1959						
	1959			1958			
	Quantity	Value/ <sup>1</sup>	Quantity	Value/ <sup>1</sup>	Quantity	Value/ <sup>1</sup>	
<b>Frozen Fish:</b>							
Tuna	17,486	53.3	1,942	9,808	27.4	1,176	
Skipjack tuna	7,928	23.9	871	6,073	17.4	747	
Swordfish	347	4.4	160	335	3.4	146	
Shrimp	88	2.0	73	228	4.5	193	
Total frozen	25,829	83.6	3,046	16,444	52.7	2,262	
<b>Canned Fish:</b>							
Bonito	16,745	174.2	6,346	12,541	116.2	4,987	
Tuna	776	6.4	233	888	7.6	326	
Total canned	17,521	180.6	6,579	13,429	123.8	5,313	
<b>Byproducts:</b>							
Fish meal	277,600	860.5	31,348	105,777	271.1	11,635	
Fish oil	17,165	44.7	1,628	1,643	4.5	193	
Sperm oil	10,004	33.9	1,235	7,352	25.7	1,103	
Whale meal	3,317	9.7	353	1,695	3.9	167	
Total by-products	308,086	948.8	34,564	116,467	305.2	13,098	
Total fishery products	351,436	1,213.0	44,189	146,340	481.7	20,673	

<sup>1</sup>F.o.b. value. The average exchange rate for U. S. dollars was 27.45 soles in 1959, and 23.30 soles in 1958.

In 1959 indicates that in addition to increases in the supply of raw material there was an increase in the recovery of oil from the fish-meal operations. (U. S. Embassy in Lima, April 12, 1960.)

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**FISH MEAL EXPORTS CONTINUED UPWARD TREND IN FIRST QUARTER OF 1960:**

The continued expansion of Peru's fish-meal industry is indicated by data on fish-meal exports through the port of Callao for January-March 1960. During that period exports through Callao of 59,752 metric tons were up 190 percent from the 20,633 tons exported through that port in the same period of 1959. Exports of fish meal from Callao by months for 1960 (1959 in parentheses) were: January 15,607 tons (5,567 tons), February 26,668 tons (9,341 tons), and March 17,477 tons (5,725 tons).

Exports from Peru via Callao in 1959 accounted for about 40 percent of the total fish-meal exports. Reports from the fish-meal industry indicate that by the end of April this year stocks of fish meal on hand will be exhausted, as close to 60,000 tons of fish meal were scheduled for export in that month. The same sources estimated that Peru would produce 400,000 tons of fish meal in 1960,

**Peru (Contd.):**

the United States Embassy in Lima reported on April 12, 1960.

The plants located in the Lima-Callao area early this year were getting complaints from residents of the metropolitan area because of the odors coming from the plants and the Maritime Terminal Basin area (where water saturated with organic fish wastes is dumped). The closing of the offending plants in the Lima area by the end of April was agreed upon by the mayors of the municipalities affected. The plants had until April 15 to stop polluting the harbor area.

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**REGULATIONS ON FISHING INDUSTRY ISSUED:**

Pursuant to Supreme Decree No. 46 of December 5, 1959, issued by the Peruvian Ministries of Marine, Agriculture, and Labor and Indian Affairs, a special commission was appointed to study conditions in the Peruvian fishing industry, particularly relations between owners and operators of fishing vessels and fishermen. By Supreme Decree No. 6 of April 15, 1960, issued by the same agencies and published in *El Peruano* of April 16, a Project of Regulations for the Fishing Industry, prepared by the special commission, was approved and incorporated into the Regulations of Captainships and National Merchant Marine.

The Regulations consist of six Chapters and 74 Articles, which may be summarized as follows:

**Chapter I:** Control of vessels, ship owners and operators, and fishermen are under the jurisdiction of Captainships of Ports. Foreign fishing vessels may not operate in Peruvian waters without express permission. Defines fish according to location where caught. Captainships of Ports must assure the strict observation of regulations for the protection of fish and of guano birds. Only Peruvian citizens or resident foreigners may engage in hunting for whales, sea lions, etc., and in the elaboration of their products.

**Chapter II:** Defines categories of fishermen, obligations of each category, documents required, and how to obtain them.

**Chapter III:** Defines fishing vessels, registration requirements, equipment, etc.

**Chapter IV:** Obligations of ship owners and operators.

**Chapter V:** Defines the three types of work contracts under which fishermen are to work, and the rights and obligations of all vessel owners, operators, and fishermen under each type.

**Chapter VI:** Provides that all risks not covered by labor contracts may be covered by private insurance, mutual companies, cooperatives, etc. Where risks are covered by work contracts, pertinent labor and social welfare legislation is applicable.

The Regulations distinguish between three types of work contracts: Society, direct labor contract, and participation contracts in which members of vessel crews participate in the proceeds of the sales of the catch. Only under the direct labor contract system can fishermen obtain social security benefits provided by law for other industries

under the Caja Nacional de Seguro Social. Most fishermen are excluded from these benefits, and this includes the anchovy fishermen who work under the participation system. Therefore, the publication of the Regulations merely clarifies points already on the statute books, and does not help satisfy the demands of the anchovy fishermen, who were still tied-up as of April 26, states an April 26, 1960, dispatch from the United States Embassy in Lima.

Anchovy fishermen at Callao and Chimbote have been on strike since April 12, with anchovy fishermen at other ports joining the strike since its inception. They are demanding four benefits: (1) standard price of 80 soles (US\$2.89) a metric ton to be paid by ship owners or operators to fishermen; (2) increase from 60 to 100 soles (US\$2.17-3.61) per day for food for crews; (3) obligatory paid rest on Sunday; (4) creation of a Mutual Fund from which social security benefits would be obtained, by payment of 5 percent of salaries by operators, and another 5 percent share by the fishermen.

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**SCHOOL FOR FISHING VESSEL CREWS ESTABLISHED:**

The Peruvian Ministry of the Navy has created a fisheries school (*La Escuela de Capacitacion de Pescas*), which was opened at Chimbote on May 15, 1960. The teaching staff will be drawn largely from the Naval School, and its first objective will be to enable operators of fishing vessels to obtain professional masters' licenses, as required by the recently-issued Fishery Industries Regulations. Later, other courses will be offered for members of vessel crews, states a May 13, 1960, dispatch from the United States Embassy in Lima.

**Philippines****IMPORT CLASSIFICATION CHANGED FOR SQUID (CUTTLEFISH):**

In an April release by the Central Bank of the Philippines, squid (cuttlefish) was one of the commodities which was classified as a nonessential consumer item. Previously, squid was classified as a decontrolled item.

As a result, imports of this product into the Philippines will be adversely affected. As a decontrolled item, importers were able to secure dollar exchange without difficulty at a fixed rate of 2.5 pesos per US\$1. As a nonessential consumer item, the importer will have to pay the "free market" rate of 4.0 pesos per US\$1 for dollar exchange, and the amount available will be limited. Thus, not only has the cost of dollar exchange

**Philippines (Contd.):**

needed to import squid increased 60 percent, but also the quantity available is limited.

This change in classification may have a strong bearing on United States exports of canned squid. In the first quarter of 1960, United States exports to the Philippines were 3,924,000 pounds and represented 86 percent of the total United States trade in that product. In 1959, total United States exports of squid to the Philippines were 6,139,000 pounds. (Manila Bulletin, April 28, 1960.)

**South-West Africa****FISHERY PRODUCTS VALUE LOWER IN 1959:**

The total value of fishery products produced in South-West Africa during 1959 is estimated to be about ±8.4 million (US\$23.4 million) as compared with ±9.3 (about US\$25.9 million) in 1958. The decline was due to a deliberately planned 25-percent reduction in the production of canned pilchards to help ease high inventories on hand at the beginning of the year.

The annual catch limit of 250,000 tons of pilchards was revised upwards to 260,000, but now includes maasbunker as well. A far more significant development was a subsequent decision by the Administration to temporarily increase the catch limit by a further 40,000 tons to a total of 300,000 tons for the year. This decision was taken to enable the six factories at Walvis Bay to step up production of fish meal to compensate for a declining market price for this product due to Peruvian competition. This additional tonnage of raw fish, coupled with a 25-percent cut back in output of canned fish, enabled the six Walvis Bay factories to turn out 60,852 tons of fish meal and 19,372 tons of fish oil in 1959 as compared with 46,200 tons and 12,381 tons respectively in 1958.

While the permanent annual limit on the catch of pilchards and maasbunker still remains at 260,000 tons, the Administration has again announced an increase in the limit for 1960 to a total of 310,000 tons or 50,000 tons above the limit.

South-West Africa's Production of Sardines (Pilchard) and Spiny Lobster Products, and White Fish Landings, 1958 and 1959		
Product	1959	1958
.....(Short Tons).....		
Pilchards:		
Canned . . . . .	41,943	58,422
Fish meal . . . . .	60,852	46,200
Fish oil . . . . .	19,377	12,381
.....(1,000 Lbs.).....		
Spiny Lobster:		
Canned . . . . .	502.7	430.3
Frozen tails . . . . .	2,478.3	1,777.3
Meal . . . . .	2,130.9	1,581.6
White fish . . . . .	6,812.4	6,619.6

Carryover stocks of fish meal, oil, and canned fish from 1959 production by South-West Africa were negligible. According to estimates from the industry, the market for canned pilchards in 1960 looks promising. The Walvis Bay factories are therefore expected to step up production of canned pilchards to the 1958 level or higher.

During the early part of the year, spiny lobster boats at Luderitz were able to bring in substantial catches due to favorable weather conditions. This enabled the six factories in that port to increase production of canned and frozen spiny lobster tails by 35 percent over the 1958 figure. (Consulate General report, dated April 1, 1960, from Cape Town.)

**Spain****ANCHOVY LANDINGS HEAVY IN BILBAO AREA:**

The anchovy fishing season in the Bilbao area of northern Spain, which opened on March 1, 1960, and ends May 31, is proving to be excellent this year. Large quantities of anchovies, canned in olive oil or salted, are being exported to the United States, Italy, and other countries. The supply is greater than the canneries can accommodate, with the result that prices have dropped to as low as 1.50 pesetas a kilogram (about 1.1 U. S. cents a pound) wholesale, and catches are being limited in accordance with instructions from the fishermen's syndicate. (United States Consulate dispatch from Bilbao, April 19, 1960.)

\* \* \* \* \*

**VIGO FISHERIES TRENDS, JANUARY-MARCH 1960:**

**Fish Exchange:** A total of 11,968 metric tons of fish were landed during the first three months of 1960, as compared with 23,280 tons for the previous quarter and 15,097 tons for the first quarter of 1959. The usual drop in fish catches during the first months of the year was sharper this year because of extremely unfavorable weather. Another factor was that the closed season for sardines started on February 15.

The total value of the landings for the first quarter of 1960 and the last quarter of 1959, calculated in U. S. dollars (at 60 pesetas to the dollar), was \$2,287,161 and \$3,197,017, respectively. For the first quarter of 1959 landings were valued at \$4,113,717 (at 42 pesetas to US\$1).

Landings during the first quarter of 1960 were: 3,218 metric tons of pomfret (1,757 tons for the fourth quarter and 4,069 tons for the first quarter of 1959); 2,498 tons of small hake (2,418 tons for the fourth quarter and 3,665 tons for the first quarter of 1959), and 1,198 tons of horse mackerel (2,228 tons for the fourth quarter and 1,590 tons for the first quarter of 1959). Sardine landings amounted to 1,083 tons (11,166 tons for the fourth quarter and 774 tons for the first quarter of 1959).

The average price per kilo for all fish at the Exchange during the first quarter of 1960 was 11.63 pesetas (8.8 U. S. cents a pound) as compared with 8.33 pesetas (6.3 U. S. cents a pound) in the fourth quarter and 11.56 pesetas (12.5 U. S. cents a pound) in the first quarter of 1959.

### Spain (Contd.):

Landings of hake continued to drop, and amounted to only 85 tons as compared with 119 tons during the previous quarter and 180 tons during the first quarter of 1959. The average price per kilo during the quarter was 56.09 pesetas (42.5 U. S. cents a pound) as compared with 63.30 pesetas (48.0 U. S. cents a pound) for the previous quarter and 59.92 pesetas (55.1 U. S. cents a pound) for the first quarter of 1958.

**Fish Canning and Processing:** Canning activity during the first quarter of the year was at the annual low-point, and usually remains so until the beginning of the new albacore season in the late spring. Exports of last year's production continued at a high rate and compensated for reduced sales domestically. Domestic sales are estimated to have dropped 10 percent in January, 20 percent in February, and about 30 percent in March as compared with the same months in 1959. While this is not a general estimate for the whole fish canning industry, it does give an indication of the general situation. The new canning season is expected to begin without the substantial unsold stocks which caused general uneasiness in the canning industry during the early part of 1959.

**Exports:** Preliminary 1959 production figures for the Spanish fish canning industry indicate a decrease from 1958 levels, while data for the first 11 months of 1959 show an increase in the volume of exports over the same period in 1958. Production declined from 53,892 metric tons in 1958 to 50,976 tons in 1959, a drop of 5.4 percent. Exports for the first eleven months increased from 11,673 tons in 1958 to 13,084 tons in 1959—an increase of 11.2 percent. Exports of canned anchovies, sardines, tuna, and "other fish" increased in this period, except for anchovies which decreased from 6,532 tons in 1958 to 4,944 tons in 1959.

**New Can Factory Proposed:** A group of 13 Vigo fish packers, in conjunction with a French firm, have solicited approval from the Ministry of Industry for the establishment of a can factory in Vigo. The French firm will provide 45 percent of the 44 million pesetas (US\$733,333) of capital—partly in the form of foreign exchange and partly in machinery and equipment.

The production of the can company is estimated at 900,000 cases a year, with an estimated raw material consumption of 5,000 metric tons of tinplate, 50 tons of tin, and 100 tons of lead. The tin and tinplate will be imported and purchased domestically, while the lead will be acquired from domestic producers.

Most of the 13 canners participating in the project are of medium to large size in comparison with the rest of the industry. Some of the largest, and most successful, exporters are not among the participants.

**Sardines:** The two months off-season on sardine catches went into effect on February 15, 1960, and continued until April 15. Designed primarily as a conservation measure to prevent exhaustion of the species in coastal waters, the ban has been in effect for several years.

**New Syndicate Tax Levied on Fish Shipments:** A new fish tax levied by the Provincial Fish Syndicate of Pontevedra on fish shipped to the interior has been imposed retroactive to January 1, 1960. The tax, originally announced as 40 pesetas per metric ton (about 67 U. S. cents a metric ton) was subsequently changed to 4 pesetas (about 6.7 U. S. cents) a metric ton. As first announced the tax was to have covered all fish landed at provincial exchanges except fish for local consumption. The tax has since been amended to exclude fish for industrial purposes locally, and now includes only fish shipped to markets outside the Province. This category, however, includes approximately two-thirds of the volume of fish landed in the port of Vigo. Estimates of the yield in Vigo, adjusted for the lowered rate and the additional exceptions, run below 200,000 pesetas (US\$3,333) annually.

**Cod:** The largest of the three important cod companies in the northwestern region of Spain has recently initiated production in its new plant in La Coruna, and is thus com-

pleting the shift in the base of its operations from Vigo to La Coruna. This shift could eventually make the latter the most important fishing port in Spain, a position long held by Vigo. The new plant, said to be one of the largest in Europe, has a reported capacity to handle approximately 30,000 metric tons of cod a year, and expects to process 24,000 tons a year initially. The plant is equipped with cold-storage rooms with a capacity of 12,000 tons, and 12 Danish-built drying tunnels capable of handling 100 tons daily.

The new plant is modern and well laid-out, but according to advocates of the factoryship as the plant of the future for the Spanish fishing industry, the new plant is excessively costly and represents a retrogression for the Spanish cod industry. To date, Spain has no factoryships in operation, although the hull of a factoryship was recently launched by a shipyard near Bilbao. However, it is said to be a long way from completion.

**Territorial Limits:** Unilateral action by Ireland in redefining its territorial waters and the opening of the Geneva Conference on the Law of the Sea have brought the problem of fishing rights home to the Spanish industry. Ireland's decision to extend the three-mile limit to a line connecting salient points has closed off several areas along the western coast of Ireland previously fished by Spanish trawlers. This unilateral action, coming just a few months before the Geneva Conference, has been widely criticized in Spanish fishery publications.

Although adoption of a "six and six" formula by the Geneva Conference would prejudice current fishing rights enjoyed by the Spanish fleet, there is an inclination within the industry to regard this as the least harmful of the various alternatives which result from the conference. Such a solution is looked upon apprehensively, however, not only because of the exclusion of Spanish vessels from certain areas, but also because of the frictions that are regarded as inevitable in the policing of extended territorial waters. (United States Consular dispatch from Vigo, April 12, 1960.)



### Sweden

#### FISH EXPORTS TO EAST GERMANY UNDER 1960 AGREEMENT:

The Swedish West Coast Fish organization in Goteborg has received an order from East Germany for fresh and frozen fish valued at 1,700,000 crowns (US\$328,100). The order, which provides for exports of frozen herring and fresh and frozen mackerel, is a supplement to the contract signed in January 1960.

The contract with East Germany at present calls for export of fish and fish products valued at 8,000,000 crowns (\$1,544,000) for deliveries during the first half of 1960. It is estimated that about 75 percent of the sales will come from the Swedish west coast.

Exports to East Germany are chiefly of herring, cod and other fish fillets. The amount of Swedish fish exports is based upon the volume of other trade between Sweden and East Germany as well

Sweden (Contd.):

as the supply of fish caught by Swedish fishermen.

In 1959, East Germany did not purchase fish and fish products for the 22.5 million crowns (\$4,342,500) provided in the global compensation arrangement and the value for the 1960 calendar year has therefore been fixed at 18 million crowns (\$3,474,000). In June or July this year it will be decided whether East Germany is going to purchase Swedish fish valued at 10 million crowns (\$1,930,000) for deliveries during the latter part of 1960. (United States Consulate dispatch from Goteborg, May 4, 1960.)



### Tunisia

#### EXPORTS OF MARINE PRODUCTS AND SNAILS TO THE UNITED STATES, 1955-59:

Cuttlefish bone and snails were the principal marine and related products exported to the United States by Tunisia for 1955-1959. Other products included

about 44 tons, valued at \$35,000 in 1959. (United States Embassy in Tunis, May 2, 1960.)

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#### FISHERIES TRENDS, MARCH 1960:

In late March 1960, a Japanese fishing vessel called at the Tunisian port of Mahdia to supply Japanese-caught tuna to the canneries in that city. In 1959, the tuna catch in Tunisia was a failure with only 200 metric tons landed as compared to a normal year's catch of 1,000 tons. The lower cost of Japanese-caught tuna has again made possible the export of Tunisian canned tuna to France. Production costs of Tunisian-caught and canned tuna remain high and inhibit exports.

Further delays have occurred in the delivery of four International Cooperation Administration-financed trawlers being constructed in Italy for Tunisia's "Office National de Peche." It is now hoped that two trawlers will be delivered in June and two in August.

With the exception of a slight increase in the export of fresh fish, Tunisian fishery products exports showed further declines in 1959, although the total fish catch

Product	Quantity					Value <sup>1/</sup>				
	1959	1958	1957	1956	1955	1959	1958	1957	1956	1955
Sponges . . . . .	-	-	-	-	-	-	-	-	7	7
Cuttlefish bone . . . . .	20	25	24	45	132	17	22	16	53	170
Snails <sup>2/</sup> . . . . .	24	37	34	54	60	18	22	13	21	26
Octopus, dried . . . . .	-	-	1	-	2	-	-	1	-	1
Sea shells . . . . .	-	-	4	7	-	-	-	4	4	-
Total . . . . .	44	62	63	106	194	35	44	34	85	204

1/Values converted at rate of 0.420 dinar equals US\$1.  
2/Snail exports are probably live land snails which are commonly sold in some of the larger United States wholesale fish markets.

small quantities of sponges, dried octopus, and sea shells. From 1955 exports of all these products dropped from 194 metric tons, valued at US\$204,000, to a-

is believed to have increased. Dinar devaluation would likely have a beneficial effect in the stimulation of fishery products exports, but improved fish-handling

Product	VALUE					
	1959		1958		1957	
	1,000 Dinars	US\$1,000	1,000 Dinars	US\$1,000	1,000 Dinars	US\$1,000
Fresh fish . . . . .	191	455	180	429	199	474
Salt, dry or smoked . . . . .	22	53	40	96	39	94
Shellfish . . . . .	77	183	188	447	107	256
Sponges . . . . .	374	891	657	1,564	731	1,740
Prepared fish products . . . . .	742	1,768	796	1,895	846	2,014
Total . . . . .	1,406	3,350	1,861	4,431	1,922	4,578

Note: One dinar equals US\$2.381.

## Tunisia (Contd.):

procedures, modernization of canneries, and reduced cost of the cans are required if the Tunisian fishing industry is to become truly competitive in the world market. (United States Embassy in Tunis, May 2, 1960.)



## U.S.S.R.

ANTARCTIC WHALING FLEETS  
RETURN AFTER GOOD SEASON:

The Soviet whale factoryship Sovieteskaya Ukraina and 19 catchers arrived in Montevideo, Uruguay, April 16, 1960, from the 1959/60 trip to the Antarctic. Soon after arrival the commanding officer called a press conference during which he expressed his satisfaction with the trip just terminated. He stated that the factoryship, which was recently completed, had a crew of 1,247 and that its construction cost of £3 million (US\$8.4 million) was more than offset by the profits (probably means gross value) from this trip which he estimated at £4 million (US\$11.2 million).

The Russian commander stated that 4,350 whales of various kinds were caught, and that the factoryship manufactured 38,600 tons of whale oil, 7,270 tons of fish meal, 2,140 tons of frozen meat suitable for animal feed, and 726 tons of frozen liver. He also said that his fleet caught more whales than any of the other whaling fleets competing in the Antarctic, among them Japanese, Norwegian, and British. He claimed that the other Soviet factoryship Slava had the second best fishing record during the season. (United States Embassy in Montevideo, April 20, 1960.)

\* \* \* \* \*

FISHERIES LANDINGS  
INCREASED IN 1959:

Fisheries landings in the Soviet Union in 1959 were close to 6.8 billion pounds (3,064,000 metric tons) as compared with about 6.5 billion pounds (2,931,000 metric tons) in 1958, according to an article in the Soviet trade magazine Rybnoe Khozajstvo (No. 1 issue for 1960) and

as reported in Fiskets Gang (April 7, 1960), a Norwegian fishery trade periodical.

The increase in landings in 1959 was at about the same level as the average increase during the 1954-58 period, or about 135,000 metric tons annually. If the increase continues at the same level for the remaining six years of the seven-year plan, the goal of the plan (4,626 million tons or about 10.2 billion pounds in 1965) will not be reached. Soviet authorities, however, expect to increase the annual level. For 1960 the plan's requirements have been increased 10 percent over the 1959 landings, that is 306,000 tons.

The Soviets did not meet the planned quota in 1959 by 40,000 tons. In the north-western area, the Estonian, the Lithuanian, Murmansk, and Archangel areas fulfilled their quotas--Murmansk by over 24,900 tons. The Latvian and the Kaliningrad areas, which are to be expanded to important ocean fishery bases, did not meet the plan's quotas.

The increased catch in 1960 will be taken by bringing new fishing areas into use. Fishing will not be intensified on the old fishing grounds which will tend to protect and increase the fishery reserves there. This is especially true in coastal and inner waters.

The demand of consumers for lean herring and certain other varieties of small fish is limited, so the catch of those species will be reduced significantly. In the North Atlantic the catch of small fish will be completely suspended, but the catch of ocean perch, cod, and flounders will be increased.

The fish-processing industry is confronted with great problems in 1960. Its production goal presupposes an increase of 7 percent and a more varied production will be required. Live fish, and iced and frozen fish must make up 23 percent of the total production. It is stated that the necessary technical equipment for such an expansion is at hand if utilized correctly. Smoked and dried fish are to constitute 4.6 percent of the production.

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## U. S. S. R. (Contd.):

## LITHUANIANS FISH

NEWFOUNDLAND BANKS:

Fifty fishing craft will be sent to the Newfoundland banks from Klaipeda (Memel), Lithuania in 1960 as compared with 11 last year, according to the March 11 issue of Sovjetskaja Litva. The vessels were due on the banks in April. The Lithuanians maintain that they have demonstrated that ocean perch can be fished profitably on the Newfoundland banks with medium-size vessels.

Defective equipment and insufficient training and experience of the crews meanwhile have continued to be serious problems.

The same periodical reports that BMRT-315 Sergej Esenin, Latvia's first large freezer trawler has returned to Riga from its second trip (December 23, 1959, to March 4, 1960). The vessel landed 550 metric tons of processed fish as compared with a planned quota of 420 tons. This included 60 tons of fish meal (planned quota 30 tons) and 15 tons of oil (planned quota 3 tons). The catch was taken on the Newfoundland banks. One drag took 20 tons of fish.

A BMRT vessel is a combination fishing craft, factory vessel, and freighter. It is equipped for filleting, processing of the waste into fish meal, manufacture of oil, freezing, and cold storage. At the end of March the BMRT-315 was scheduled to depart on its third trip. (Fiskets Gang, Norwegian fish trade periodical, April 14, 1960.)

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SEVEN-YEAR PLAN INCLUDES EXPANSION OF FISH FREEZING:

Included in Russia's seven-year (1959-1965) plan for the development of quick-freezing facilities for many foods, is the threefold expansion of quick-freezing of fish. The plan calls for the production of 1,300,000 metric tons of frozen fish by 1965--900,000 tons to be frozen aboard vessels and 400,000 tons frozen ashore. This is three times the amount of fish frozen at present.

To aid in achieving the planned goal, the Soviet Union has one research Institute for quick-freezing which employs 65 technicians and 165 other workers. Many other well-equipped laboratories are also available. (Indust. Obst.-u. Gemuseverw., vol. 44, no. 19, Oct. 8, 1959, pp. 442-443).

JAPANESE CAPTURE DOLPHIN AND PILOT WHALES FOR AQUARIUMS

At the port of Arari in Shizuoka Prefecture, Japan, famous for live captures of porpoise, a large school of pilot whales (blackfish) and bottle-nose dolphin appeared on June 10, 1960. With the regular season nearing its end, the fishermen of Arari had resigned themselves to having no "porpoise bonus" this year, but the advent of the big school, the first in 17 months, roused them to furious activity. On June 10 a total of 120 pilot whales and 50 bottle-nose dolphin were captured. Pilot whales are worth 6,000 yen (US\$17) each to aquariums, and the dolphin, which are the most talented of cetacean performers, bring 50,000 yen (\$140) each. Thus the day's catch was worth over 3 million yen (\$8,300) to the fishermen of Arari. (Nippon Suisan Shimbun, June 15, 1960.)

# FEDERAL ACTIONS

## Federal Trade Commission

### CRAB FISHERMEN'S ASSOCIATION DENIES CHARGES OF UNFAIR COMPETITION AND RESTRAINT OF TRADE:

A Westport, Washington, Association of crab fishermen and its officials, trustees, and fishermen members, have denied (Answer 7859, Crabs) Federal Trade Commission charges that they have illegally restrained competition in the Dungeness crab industry in their area.

Relying to the Commission's April 7, 1960, complaint, they state the association is a fishermen's cooperative organization operating under the Fisherman's Cooperative Marketing Act, which entrusts to the Secretary of the Interior exclusive jurisdiction for determining whether any such association monopolizes or restrains trade in interstate or foreign commerce.

The Commission, they declare, "is therefore without jurisdiction to proceed in this matter. The Department of the Interior has heretofore considered the same practices and acts herein complained of and determined that there is no evidence of any monopolistic practices unduly enhancing the price of crab."

A further contention is that under the Fisherman's Cooperative Act the Association and its members are immune from civil proceedings based on the antitrust laws in the absence of any allegation they have entered into transactions with persons or organizations not accorded immunity under the statute.

The respondents deny Commission charges that they have used threats of reprisals, intimidation, and physical violence and other coercive methods in a conspiracy to prevent other dealers from buying or selling processed and unprocessed crabs and to get nonmember crab fishermen to join the association.

The association admits the "Membership Agreement" gives it the power to determine the canners and crab processors with whom it and the members will deal. However, it denies the Commission's allegation that its main function is to fix prices paid by canners to members for their catch, which is taken from the coastal waters of Washington and Oregon and the adjacent ocean.

The members account for "a majority" of the fresh crabs originating in the former State, not "almost all" as the complaint alleged, the answer says. Similarly, it states, the association's total membership is about 180 fishermen, not 250; and 50 members, not 90, formed a cooperative known as Washington Crab Producers, Inc., and bought a crab processing cannery which competes with all other crab processors and canners.

The respondents further deny charges that (1) they have actual or potential power to monopolize all phases of the crab industry in their area because substantially the same men control the crab fishing fleet through the association, and own or control the cannery cooperative, and (2) this monopoly power, coupled with the coercive tactics allegedly employed, tends to unlawfully destroy competition in the industry.

Joining in the answer to the complaint are the trustees or officers of the association who act as representatives of the entire membership.

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### SHRIMP PROCESSING MACHINERY FIRM CHARGED WITH SUPPRESSING COMPETITION:

The Federal Trade Commission issued charges on May 19, 1960, that a New Orleans, La., partnership has un-

lawfully achieved a virtual monopoly in the shrimp-processing machinery business, and suppressed competition in the \$16-million-a-year shrimp industry (Complaint 7887, Shrimp.)

Joined in the Commission's complaint are the firm's 6 active partners, who also are cited as representative of the approximately 26 limited partners; and a packing company of Houma, La., which is a silent partner and also is owned and controlled by members of the family owning the New Orleans shrimp-processing machinery firm.

The machinery firm leases, licenses, and sells shrimp-processing machinery, including peelers, cleaners, graders, de-veiners, and separators. The Houma packing company is one of the nation's largest processors of raw shrimp, which is taken primarily from the Gulf Coast fishing area, the complaint says.

Prior to 1947, it continues, shrimp was picked by hand labor. In that year two of the partners received a U. S. patent for a peeling machine, and since that time the New Orleans machinery firm has obtained ownership or control of numerous additional patents on processing machinery. Due to the efficiency of these machines, domestic shrimp processors must use them in their plants in order to compete in the market.

The complaint charges that the New Orleans machinery firm and its predecessor company have used these typical unfair methods of competition in interstate and foreign commerce: (1) entering into agreements with patentees and prospective patentees, thus obtaining exclusive rights to processing machines; and in most instances never attempting to manufacture, develop, or commercially exploit such machinery; (2) acquiring from inventors rights to all their future inventions in this field; (3) filing patent infringement suits against manufacturers and users of a competitive peeler developed by a New Orleans inventor and patented by him in 1957; and offering unfair selling terms to purchasers and prospective purchasers of this machine located in foreign countries; (4) requiring licensees to buy a certain number of the firm's debentures at \$500 each,

most of which do not become payable until 1966; and (5) charging licensees in Oregon, Washington, and Alaska discriminatory and much higher rates than those granted to licensees in other states.

The complaint further charges that the New Orleans machinery firm and the Houma packing firm have combined in carrying out these unfair practices, which have had the following adverse effects, among others: the New Orleans machinery firm has acquired a virtual monopoly in the domestic shrimp-processing machinery market; its competitors and potential competitors have been hindered in their business; inventors and potential inventors have been deterred in the distribution and marketing of their machines; shrimp processors in competition with the Houma packing firm have been injured, and a tendency toward monopoly in the shrimp industry has occurred.

The respondents were granted 30 days in which to file answer to the complaint.



## **Department of Health, Education, and Welfare**

**FOOD AND DRUG ADMINISTRATION**

### **PROPOSED ADDITION TO LIST OF SPICES, SEASONINGS, ETC., RECOGNIZED AS SAFE:**

The U. S. Food and Drug Administration proposes to add to the list of spices, seasonings, essential oils, etc. recognized as safe and exempt from the requirement of tolerances. The additional list includes about 82 spices and other natural seasonings and flavorings, essential oils, oleoresins, and natural extractives. Included in the list are such items as chervil, thyme, sage, lemon peel, ambergris, algae, dulse, etc. The common name and botanical name of plant source is given in the list. The proposed additions were listed in the Federal Register of May 19, 1960. Interested persons were given 30 days from the date of publication to file written comments on the proposal.

In the January 19 issue of the Federal Register, a list of about 70 spices and other natural seasonings and flavorings; 128 essential oils, oleoresins, and natural extractives; and 3 miscellaneous additives were listed by the Food and Drug Administration as safe for intended use, within the meaning of the Federal Food, Drug, and Cosmetic Act. The May 19 proposal would add to the January 19 list.

Those interested in complete details should write directly to the Food and Drug Administration, Washington 25, D. C.



## Department of the Interior

FISH AND WILDLIFE SERVICE

BUREAU OF COMMERCIAL FISHERIES

### QUALITY STANDARDS ESTABLISHED FOR FROZEN SALMON STEAKS:

Voluntary standards for the production of high-quality frozen salmon steaks

## Title 50—WILDLIFE

### Chapter I—Fish and Wildlife Service, Department of the Interior

#### SUBCHAPTER K—PROCESSED FISHERY PRODUCTS, PROCESSED PRODUCTS THEREOF, AND CERTAIN OTHER PROCESSED FOOD PRODUCTS

#### PART 178—UNITED STATES STANDARDS FOR GRADES OF FROZEN SALMON STEAKS

On page 1730 of the FEDERAL REGISTER of February 27, 1960, there was published a notice and text of a proposed new Part 178 of Title 50, Code of Federal Regulations. The purpose of the new part is to issue United States Standards for Grades of Frozen Salmon Steaks under the authority transferred to the Department of the Interior by section 6(a) of the Fish and Wildlife Act of August 8, 1958 (16 U.S.C. 742e).

Interested persons were given until March 26, 1960, to submit written comments, suggestions or objections with respect to the proposed new part. No comments, suggestions or objections have been received, and the proposed new part is hereby adopted without change and is set forth below. This amendment shall become effective at the beginning of the 30th calendar day following the date of this publication in the FEDERAL REGISTER.

Dated: April 29, 1960.

ELMER F. BENNETT,  
Acting Secretary of the Interior.

became effective May 5 when they were published in the Federal Register of that date. Notice of intention to establish the salmon steak standards was carried in the Federal Register on February 27, 1960.

The standards were developed by the U. S. Bureau of Commercial Fisheries in cooperation with the fishing industry. Public meetings were held in Seattle, Wash.; Chicago, Ill.; and New York City, N. Y. Firms adopting the standards and the accompanying inspection may mark the product "U. S. Grade A" or "U. S. Grade B"--both designated good-quality merchandise.

The Bureau of Commercial Fisheries, with the help of the fishing industry, has already established quality standards for frozen fried fish sticks, raw frozen breaded shrimp, frozen raw halibut steaks, frozen haddock fillets, cod fillets, raw breaded portions, and frozen fish blocks.

The Bureau reports that there are now 32 processors with continuous inspection service.

#### PRODUCT DESCRIPTION, STYLE, AND GRADES

Sec.	Product description.
178.1	Product description.
178.2	Style of frozen salmon steaks.
178.3	Grades of frozen salmon steaks.

#### DIMENSIONS

178.6	Recommended dimensions.
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#### FACTORS OF QUALITY AND GRADE

178.11	Ascertaining the grade.
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#### DEFINITIONS

178.21	Definitions.
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#### LOT CERTIFICATION TOLERANCES

178.25	Tolerances for certification of officially drawn samples.
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#### SCORE SHEET

178.31	Score sheet for frozen salmon steaks.
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#### PRODUCT DESCRIPTION, STYLES, AND GRADES

##### § 178.1 Product description.

Frozen salmon steaks are clean, whole-some units of frozen raw fish flesh with normally associated skin and bone and are 2.5 ounces or more in weight. Each steak has two parallel surfaces and is derived from whole or subdivided salmon slices of uniform thickness which result from sawing or cutting dressed salmon perpendicularly to the axial length, or backbone. The steaks are prepared from either frozen or unfrozen salmon (*Oncorhynchus spp.*) and are processed and frozen in accordance with good commercial practice and are maintained at

temperatures necessary for the preservation of the product. The steaks in an individual package are prepared from only one species of salmon.

(a) *Species*. Frozen salmon steaks covered by this standard are prepared from salmon of any of the following species:

Silver or coho (*O. kisutch*).  
Chum or keta (*O. keta*).  
King, chinook, or spring (*O. tshawytscha*).  
Red, sockeye (*O. nerka*).  
Pink (*O. gorbuscha*).

##### § 178.2 Styles of frozen salmon steaks.

(a) *Style I—Random weight pack*. The individual steaks are of random weight and neither the individual steak weight nor the range of weights is specified. The steaks in the lot represent the random distribution cut from the head to tail of a whole dressed salmon.

(b) *Style II—Random weight combination pack*. The individual steaks are of random weight and neither the individual steak weight nor range of weights is specified. The steaks in the lot represent a combination of cuts from selected parts of the whole dressed salmon.

(c) *Style III—Uniform weight or portion pack*. All steaks in the package or in the lot are of a specified weight or range of weights.

##### § 178.3 Grades of frozen salmon steaks.

(a) "U. S. Grade A" is the quality of frozen salmon steaks that possess good flavor and odor, and that for those factors which are rated in accordance

with the scoring system outlined in the following sections the total score is not less than 85 points.

(b) "U.S. Grade B" is the quality of frozen salmon steaks that possess at least reasonably good flavor and odor, and that for those factors which are rated in accordance with the scoring system outlined in the following sections the total score is not less than 70 points.

(c) "Substandard" is the quality of frozen salmon steaks that fail to meet the requirements of the "U.S. Grade B."

#### DIMENSIONS

##### § 178.6 Recommended dimensions.

(a) The recommended dimensions of frozen salmon steaks are not incorporated in the grades of the finished product since dimensions, as such, are not factors of quality for the purpose of these grades. However, the degree of uniformity of thickness among units of the finished product is rated since it is a factor affecting the quality and utility of the product.

(b) It is recommended that the thickness (smallest dimension) of individually frozen salmon steaks be not less than  $\frac{1}{2}$  inch and not greater than  $1\frac{1}{2}$  inches.

#### FACTORS OF QUALITY AND GRADE

##### § 178.11 Ascertaining the grade.

The grade is ascertained by observing the product in the frozen, thawed, and cooked states and is determined by consideration of the following:

(a) *Factors rated by score points.* The quality of the product with respect to all factors is scored numerically. Cumulative point deductions are assessed for variations of quality for the factors in accordance with the schedule in Table I, in the frozen, thawed, and cooked states. The total deduction is subtracted from the maximum possible score of 100 to obtain the "product score."

(b) *Factors governed by "limiting rule".* The factors of flavor and odor, in addition to being rated by score points, are further considered for compliance with the "limiting rule" grade requirements of flavor and odor in Table I, as defined under Definitions § 178.21(g) (9) and (10).

(c) *Determination of the final product grade.* The final product grade is derived on the basis of both the "product score" and the "limiting rule" grade requirements of flavor and odor, per Table I.

#### DEFINITIONS

##### § 178.21 Definitions.

(a) "Slight" refers to a defect that is scarcely noticeable and may not affect the appearance, the desirability, and/or eating quality of the steaks.

(b) "Moderate" refers to a defect that is conspicuously noticeable (not seriously objectionable) and does not seriously affect the appearance, desirability, and/or eating quality of the steaks.

(c) "Excessive" refers to a defect that is conspicuously noticeable (seriously objectionable) and seriously affects the appearance, desirability, and/or eating quality of the steaks.

(d) "Occurrence" is defined as each incidence of the same or different types of defects.

(e) "Cooked state" means that the thawed, unseasoned product has been heated within a boilable film-type pouch by immersing the pouch with product in boiling water for 10 minutes. Steaks cooked from the frozen state may require about two additional minutes of cooking.

(f) "Actual net weight" means the weight of the salmon steaks within the package after removal of all packaging material, ice glaze or other protective coatings.

(g) "Scored factors" (Table I):

(1) "General appearance defects" refer to poor arrangement of steaks, distortion of steaks, wide variation in shape between steaks, greater than normal number of head and/or tail pieces, embedding of packaging material into fish flesh, inside condition of package, frost deposit, excessive or non-uniform skin glaze, and undesirable level of natural color.

(2) "Dehydration" refers to the appearance of a whitish area on the surface of a steak due to the evaporation of water or drying of the affected area.

(3) "Uniformity of thickness" means that steak thickness is within the allowed  $\frac{1}{8}$ -inch manufacturing tolerance between the thickest and thinnest parts of the steaks within a package or sample unit.

(4) "Uniformity of weight and minimum weight" is defined in Table I. Portions are designated by "weight range" or "specified weight." The "weight range" of portions bearing "specified weight" designation on containers shall be taken as the "specified weight" plus or minus 0.5 ounce unless otherwise specified.)

(5) "Workmanship defects" refers to appearance defects that were not eliminated during processing and are considered objectionable or poor commercial practice. They include the following: Blood spots, bruises, cleaning (refers to inadequate cleaning of the visceral cavity from blood, viscera and loose or attached appendages), cutting (refers to irregular, inadequate, unnecessary, or improper cuts and/or trimming), fins, foreign material (refers to any loose parts, of fish or other than fish origin), collar bone, girdle (refers to bony structure adjacent to fin), loose skin, pug marks, sawdust and scales.

(6) "Color defects":

(i) "Discoloration of fat portion" means that the normal color of the fat

TABLE I—SCHEDULE OF POINT DEDUCTIONS FOR FACTORS RATED BY SCORE POINTS<sup>1</sup>

Scored factors	Description of quality variation	Deduct
<b>FROZEN</b>		
1. General appearance defects.....	Per occurrence: Slight..... Moderate..... Excessive.....	1-2 3-5 5-10
2. Dehydration.....	(Per occurrence) for each 1 sq. in. of surface area: For each $\frac{1}{16}$ inch above $\frac{1}{8}$ " variation tolerance in steak thickness (max. deduction: 6 points). <i>Style I &amp; II—Random weight.</i> For each steak be- tween 2 and 3.0 ounces in weight per package, or per pound of products for packages over 1 pound net wt.	1-2 3-5 4
3. Uniformity of thickness.....	<i>Style III—Uniform weight or portion.</i> For each 0.1 ounce beyond the 0.1 ounce tolerance of the specified portion weight range per 5 lbs. of prod- ucts.	1
4. Uniformity of weight and minimum weight.....	Per cent sample area affected: 0-20..... 21 to 50..... 51 to 75..... 76 to 100.....	2-4 5-8 8-10 1-2 3-5 6-10 1-2 3-5 6-15
<b>THAWED</b>		
5. Workmanship defects: Blood spots, bruises, cleaning, cutting, fins, foreign material, collar- bone, girdle, loose skin, pug marks, sawdust, scales.	Per occurrence: Slight..... Moderate..... Excessive.....	1-2 3-5 5-8
6. Color defects:	Slight..... Moderate..... Excessive.....	1-2 3-5 5-8
(a) Discoloration of fatty portion.....	Slight..... Moderate..... Excessive.....	1-2 3-5 5-8
(b) Discoloration of lean portion.....	Slight..... Moderate..... Excessive.....	1-2 3-5 5-8
(c) Non-uniformity of color.....	Slight..... Moderate..... Excessive.....	1-2 3-5 5-8
7. Honeycombing.....	Percent sample area affected: 0-20..... 21 to 50..... 51 to 75..... 76 to 100.....	1-2 3-5 5-8 6-15
<b>COOKED</b>		
8. Texture defect (tough, dry, fibrous, or watery).	Slight..... Moderate..... Excessive.....	1-2 3-5 5-8
9. Odor <sup>2</sup> .....	Good (A)..... Reasonably good (B)..... Substandard (S).....	0-2 0-3 0-3 0-3 0-3 0-15
10. Flavor <sup>2</sup> :	Good (A)..... Reasonably good (B)..... Substandard (S).....	0-2 0-3 0-3 0-3 0-3 0-15
(a) Lean portion.....	Good (A)..... Reasonably good (B)..... Substandard (S).....	0-2 0-3 0-3 0-3 0-3 0-15
(b) Fatty portion.....	Good (A)..... Reasonably good (B)..... Substandard (S).....	0-2 0-3 0-3 0-3 0-3 0-15

<sup>1</sup> This schedule of point deductions is based on the examination of sample units composed of: (a) An entire sample package and its contents (for retail sized packages) or (b) a representative subsample consisting of about one pound of salmon steaks taken from each sample package (for institutional sized packages), except that the entire sample package or its equivalent shall be examined for factor 4.

<sup>2</sup> "Odor" and "flavor" are synonymous. "Flavor" and "odor": Salmon steaks which receive over 5 deduction points for odor, or flavor of the lean, or flavor of the fatty portion, shall not be graded above substandard, and those which receive between 3 to 5 points shall not be graded above "U.S. Grade B," regardless of the total product score. (This is a "limiting rule" based on flavor and odor as defined under definitions § 178.21(g) (9) and (10)).

shows increasing degrees of yellowing due to oxidation.

(ii) "Discoloration of lean portion" means that the normal surface flesh color has faded or changed due to deteriorative influences.

(iii) "Non-uniformity of color" refers to noticeable differences in surface flesh color on a single steak or between adjacent steaks in the same package or sample unit. It would also include color variation of the visceral cavity and skin watermarking.

(7) "Honeycombing" refers to the visible appearance on the steak surface of numerous discrete holes or openings of varying size.

(8) "Texture defect" refers to an undesirable increase in toughness and/or dryness, fibrousness, and watery nature of salmon examined in the cooked state.

(9) "Odor" and "flavor":

(i) "Good flavor and odor" (essential requirement for Grade A) means that the fish flesh has the good flavor and odor characteristic of the indicated species of salmon, and is free from

rancidity and from off-flavors and off-odors.

(ii) "Reasonably good flavor and odor" (minimum requirement for Grade B) means that the fish flesh may be somewhat lacking in the good flavor and odor characteristics of the indicated species of salmon, is reasonably free of rancidity, and is free from objectionable off-flavors and off-odors.

(iii) "Substandard flavor and odor" (substandard grade) means that the flavor and odor fail to meet the requirements of "reasonably good flavor and odor."

#### LOT CERTIFICATION TOLERANCES

#### § 178.25 Tolerances for certification of officially drawn samples.

The sample rate and grades of specific lots shall be certified on the basis of Part 170 of this chapter (Regulations Governing Processed Fishery Products, 23 F.R. 5064, July 3, 1958).

#### SCORE SHEET

#### § 178.31 Score sheet for frozen salmon steaks.

Note: Also see Commercial Fisheries Review, April 1960 p. 74.

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#### VOLUNTARY GRADE STANDARDS PROPOSED FOR FROZEN RAW HEADLESS SHRIMP:

Frozen raw headless shrimp voluntary grade standards are proposed by the U. S. Bureau of Commercial Fisheries. The regulations are proposed for adoption in accordance with the authority contained in Title II of the Agricultural Marketing Act of August 14, 1946, as amended. Functions under that Act pertaining to fish, shellfish, and any products thereof were transferred to the Department of the Interior by section 6(a) of the Fish and Wildlife Act of August 8, 1958.

The proposed standards (published in the Federal Register of May 7, 1960), if recommended to the Secretary of the Interior for adoption and made effective, will be the first issued by the Department prescribing voluntary grade standards for frozen raw headless shrimp.

The proposed standards include product description, grades, sizes; factors of quality and grade, including ascertaining the grade; definitions; lot certification tolerance; and score sheet.

The frozen raw headless shrimp are described as clean, wholesome, headless, shell-on shrimp of the regular commercial species. They are sorted for

Label:	.....
Size and kind of container:	.....
Container mark or identification:	.....
Size of lot:	.....
Number of packages per master carton:	.....
Number of samples:	.....
Product style:	.....
Actual net weight:	(ounces) (lb.)

Scored factors	Deductions
FROZEN	
1. General appearance defects.....	
2. Dehydration.....	
3. Uniformity of thickness.....	
4. Uniformity of weight.....	
THAWED	
5. Workmanship defects.....	
6. Color defects.....	
7. Honeycombing.....	
COOKED	
8. Texture.....	
9. Odor (Limiting rule—Table I).....	
10. Flavor (Limiting rule—Table I).....	
Total deductions.....	

Product score (100—Total deductions).  
Flavor and odor rating.....

Final grade.....

size, packed, and frozen in accordance with good commercial practice and are maintained at temperatures necessary for the preservation of the product. Four different grades will be established: (1) "U. S. Grade A" or "U. S. Fancy"; (2) "U. S. Grade B" or "U. S. Good"; (3) "U. S. Grade C" or "U. S. Commercial"; and (4) "Substandard." The size categories as listed in the proposed standards are: under 10 count, 10-15 count, 16-20 count, 21-25 count, 26-30 count, 31-35 count, 36-42 count, 43-50 count, 51-60 count, 61-70 count, and over 70 count. Count is the number of shrimp per pound.



#### Eighty-Sixth Congress (Second Session)

Public bills and resolutions which may directly or indirectly affect fisheries and allied industries are reported. Introduction, referral to Committees, pertinent legislative actions, hearings, and other actions by the House and Senate, as well as signature into law or other final disposition are covered.



**ALASKA FISHERIES: Arctic Wildlife Range--** Alaska (Hearings before the Merchant Marine and Fisheries Subcommittee of the Committee on Interstate and Foreign Commerce, United States Senate, 86th Congress, Second Session, on S. 1899, a bill to authorize the establishment of the Arctic Wildlife Range, Alaska, and for other purposes, October 20, 22, 24, 26, 27, 28, 29, 30, 31, 1959, and April 22, 1960. Part 2-Ketchikan, Juneau, Anchorage, Seward, Cordova, Valdez, and Fairbanks, Alaska), 457 pp., printed. Contains statements, letters, telegrams, and resolutions of various citizens, clubs, and various Federal Government and state officials, on the establishment of the Wildlife Range by the Federal Government. A statement by the assistant librarian of the Alaska Historical Library refers to the fisheries management of the U. S. Fish and Wildlife Service before Alaska became a state with particular reference to the conservation of the king salmon. The statement of an Alaskan state senator gives a brief history of the salmon industry since the year 1925. Also contains and refers to the 1949 edition, Code of Federal Regulations, title 50, "Wildlife," subpart C. "Taking of Wildlife," a section of which is entitled "Public Fishing."

**AREA ASSISTANCE ACT OF 1960:** S. 3569 (Dirksen, for himself and Bush, Beall, Keating, Morton, and Javits), a bill introduced on May 18, 1960, to establish a program of financial and technical assistance designed to alleviate conditions of substantial and persistent unemployment in economically depressed areas, and for other purposes; to the Committee on Banking and Currency. This legislation is introduced to replace the Area Assistance Bill (S. 722) which was vetoed by the President on May 13, 1960, but without those features that the President found objectionable. An identical bill H. R. 12286 (Widnell), and three similar bills H. R. 12290 (Van Zandt), H. R. 12291 (Fenton), and H. R. 12298 (Saylor) were introduced in the House on the same date. H. R. 12490 (Siler), identical to S. 3569, was introduced in the House on June 1, 1960.

**CHEMICAL PESTICIDES COORDINATION ACT:** On May 26, 1960, the Committee on Merchant Marine and Fisheries met in executive session and ordered favorably reported to the House a clean bill, H. R. 12419, in lieu of H. R. 11502, to provide for advance consultation with the Fish and Wildlife Service and with state wildlife agencies before the beginning of any Federal program involving the use of pesticides or other chemicals designed for mass biological controls. H. R. 12419 (Wolf), was the Committee bill, which was introduced in House on May 26; H. R. 12463 (King of Utah) was introduced in House on June 1, 1960, similar to H. R. 11502; both were referred to the Committee on Merchant Marine and Fisheries.

H. R. 12419 was reported out by the Committee on Merchant Marine and Fisheries on June 9, 1960 (H. Rept. 1786), and referred to the Committee of the Whole House on the State of the Union.

H. Rept. 1786, Providing for Advance Consultation Before the Beginning of any Federal Program Involving the Use of Pesticides or Other Chemicals (June 6, 1960, 86th Congress, Second Session, Report from the Committee on Merchant Marine and Fisheries to accompany H. R. 12419), 6 pp..

printed. The purpose of the legislation is to increase protection to wildlife from the use of pesticides and chemicals used for the control of agricultural pests. This would be achieved by a requirement that, before a program involving the use of chemical insecticides, herbicides, fungicides, rodenticides, or other chemicals be initiated or financed by the Federal Government, the initiating agency be required to inform the U. S. Fish and Wildlife Service and to consult with that Service with a view toward minimizing the adverse effect of the program on fish and wildlife resources. Report discusses purpose and need of legislation; presents the reports on the bill submitted by the departments of Agriculture, Interior, and Health, Education, and Welfare. Committee reported favorably on the bill without amendment.

The Senate Committee on Interstate and Foreign Commerce on June 16, 1960, submitted Rept. No. 1601 on S. 3473 (Magnuson) introduced in Senate May 3, 1960, similar to H. R. 12419. A committee amendment substituted the text of H. R. 12419.

**COLOR ADDITIVES IN FOOD:** On May 9, 1960, the House Committee on Interstate and Foreign Commerce concluded hearings on H. R. 7624, a bill to protect the public health by amending the Federal Food, Drug, and Cosmetic Act so as to authorize the use of suitable color additives in or on foods, drugs, and cosmetics, in accordance with regulations prescribing the conditions (including maximum tolerance) under which additives may be safely used. H. R. 7624 (Harris) introduced in the House on June 9, 1959, was reported out by the Committee on Interstate and Foreign Commerce on June 7, 1960 (H. Rept. 1761).

H. Res. 599 (Delaney), introduced in the House on June 14, a resolution for the consideration of and 2 hours debate on H. R. 7624; resolution reported out without amendment (H. Rept. No. 1867).

H. Rept. No. 1761, Color Additive Amendments of 1960 (June 7, 1960, 86th Congress, Second Session, Report of the Committee on Interstate and Foreign Commerce, U. S. House of Representatives, to accompany H. R. 7624), 97 pp., printed. This legislation is to protect the public health by amending the Food, Drug, and Cosmetic Act so as to authorize the use of suitable color additives in or on foods, drugs, and cosmetics, in accordance with regulations prescribing the conditions (including maximum tolerances) under which such additives may be safely used. The report gives committee amendments, purpose and a general summary of the legislation, background information on coal-tar and other colors, need for legislation, a detailed explanation of the committee bill and a section by section analysis, changes in existing law, and reports of executive departments and agencies.

**COMMERCIAL FISHING INDUSTRY STAMPS:** S. 3624 (Mrs. Smith), a bill to provide a special series of postage stamps to be known as Commercial Fishing Industry Stamps, introduced in the Senate on June 6, 1960, and referred to the Senate Committee on Post Office and Civil Service. The purpose of the bill is to acquaint the people with the importance of the commercial fishing industry in the United States by having the Postmaster

General issue, as early as practicable in the calendar year 1960, a special series of 4-cent postage stamps of an appropriate design, which would be known as Commercial Fishing Industry Stamps.

**CONSERVATION OF FISH AND SHELLFISH:** H. J. Res. 705 (Pelly), a joint resolution introduced in the House on May 10, 1960, to promote the conservation of ocean fish and shellfish; to the Committee on Ways and Means. Identical to S. J. Res. 184, which was introduced in the Senate on April 7, 1960.

**EXEMPTION FROM REGULATION OF TRANSPORTATION OF BULK COMMODITIES BY RAILROAD:** S. 3618 (Magnuson) introduced in Senate June 6, 1960, a bill to amend the Interstate Commerce Act, as amended, so as to provide that the transportation of bulk commodities by railroad shall be exempt from regulation. The purpose of the bill is to provide that the transportation of commodities in bulk, shall be accorded exemption from regulation similar to, but broader than, the exemption now granted water carriers subject to the Interstate Commerce Act.

**EXEMPT RAILROAD TRANSPORTATION FOR FISH, LIVESTOCK, AND AGRICULTURAL COMMODITIES:** H. R. 12413 (Rostenkowski), introduced in House on May 26, 1960, a bill to amend the Interstate Commerce Act, as amended, so as to extend to the railroads a conditional exemption from economic regulation comparable to that provided for motor carriers engaged in the transportation of ordinary livestock, fish, or agricultural commodities; to the Committee on Interstate and Foreign Commerce. At the same time H. R. 12414 (Rostenkowski) was also introduced in the House, a bill to provide for the economic regulation of certain motor vehicles heretofore conditionally exempt therefrom under the provisions of section 203(b) (6) of the Interstate Commerce Act, as amended, and for other purposes; to the Committee on Interstate and Foreign Commerce. These two bills have objectives which clash, but Congressman Rostenkowski offered them in order that Congress would choose one in order to eliminate the inequality of treatment for different modes of transportation as far as fish, livestock, and agricultural commodities are concerned.

**FEDERAL WATER POLLUTION CONTROL ACT:** S. 3574 (Case of South Dakota), a bill introduced in the Senate on May 19, 1960, to strengthen the enforcement provisions of the Federal Water Pollution Control Act and extend the duration of the authorization of grants for State water pollution control programs, and for other purposes; to the Committee on Public Works. This legislation would make the following changes in the Federal Water Pollution Control Act: Extend, for an additional 5 years, the provision for Federal grants to State and Interstate water pollution control agencies for administration of their programs; make it possible for several communities to get individual Federal grants and use these funds in the construction of sewage treatment facilities; make all interstate navigable waters and coastal waters subject to Federal abatement enforcement authority whether or not there is a showing of interstate pollution if abatement action is requested by a State or municipality with the concurrence of the State,

and authorize the Secretary of Health, Education, and Welfare to issue final orders in enforcement actions; make discharges from Federal installations subject to administrative findings and recommendations in Federal water pollution abatement actions conducted by the Department of Health, Education, and Welfare; also includes a clarifying amendment in section 12, which preserves existing functions of other Federal agencies in the water pollution control field. Identical bills were introduced in the House: May 19, 1960, H. R. 12309 (Auchincloss), and on May 23, 1960, H. R. 12343 (Schwengel).

**FISH AND WILDLIFE COOPERATIVE RESEARCH TRAINING UNITS:** On May 26, 1960, S. 1781 (in lieu of H. R. 5814), a bill to provide for cooperative unit programs of research, education, and demonstration between the Federal Government of the U. S., colleges and universities, the several States and territories, and private organizations, was considered in executive session of Committee on Merchant Marine and Fisheries and ordered favorably reported to the House without amendment. On June 9, the House Committee on Merchant Marine and Fisheries submitted Rept. No. 1783 on S. 1781, referred to the Whole House on the State of the Union.

H. Rept. 1783, Authorizing Continuance of Cooperative Unit Programs of Research and Education Relating to Fish and Wildlife (June 9, 1960, 86th Congress, Second Session, Report from the Committee on Merchant Marine and Fisheries to accompany S. 1781), 4 pp., printed. The purpose of the bill is to continue the development of cooperative units by the Federal Government, states, educational institutions, and nonprofit organizations for research and training programs in the field of fish and wildlife resources. At present, such programs are maintained in some 16 states and a very considerable part of their work is the education of men and women to augment the number of trained people required for the proper conduct of the manifold activities required to maintain and develop our fish and wildlife resources. Report discusses need and cost of legislation and presents the Interior Department Report on the bill. Committee reported favorably on the bill without amendment.

**FISHERIES ASSISTANCE ACT OF 1959:** On May 5, 1960, Senator Lausche filed a motion in the Senate to reconsider action of the Senate taken on May 3, in adopting conference report on H. R. 5421, a bill to provide a program of assistance to correct inequities in the construction of fishing vessels and to enable the fishing industry of the United States to regain a favorable economic status, and for other purposes.

On May 10, 1960, the House returned to the Senate in accordance with motion entered on May 5 by Senator Lausche, H. R. 5421 (with accompanying papers).

Pursuant to unanimous-consent request of June 6, 1960, the Senate adopted the Lausche motion to reconsider by vote the conference report on H. R. 5421. On reconsideration of this action the Senate by a 59-26 majority, again adopted the conference report.



**FISHERIES COOPERATIVE MARKETING ACT**

**AMENDMENT:** The Subcommittee on Fisheries and Wildlife Conservation of the House Committee on Merchant Marine and Fisheries on June 7, 1960, considered H. R. 2777 (McCormack), a bill to amend the Fisheries Cooperative Marketing Act, introduced in the House on January 19, 1959. The bill provides that fishermen's cooperatives shall not be subject to the provisions of the Antitrust Act.

**FISHERY LOAN FUND MORTGAGE FORECLOSURES:** A letter from the Assistant Secretary of the Interior, transmitting a draft of proposed legislation to facilitate administration of the fishery loan fund established by section 4 of the Fish and Wildlife Act of 1956, and for other purposes (with an accompanying paper), was laid before the Senate on June 1, 1960, by the Vice President, and referred to the Senate Committee on Interstate and Foreign Commerce. Would give Secretary of the Interior authority to dispose of property acquired through foreclosure of vessel mortgages under the fishery loan fund.

**S. 3631 (Magnuson),** a bill to facilitate administration of the fishery loan fund established by section 4 of the Fish and Wildlife Act of 1956, and for other purposes, introduced in the Senate on June 6, 1960, and referred to the Senate Committee on Interstate and Foreign Commerce.

**FISH HATCHERIES:** On June 9, the Committee on Merchant Marine and Fisheries submitted Rept. No. 1784 on S. 2053, an act to provide for the acceptance by the United States of a fish hatchery in the State of South Carolina; without amendment; referred to the Committee of the Whole House on the State of the Union.

**H. Rept. No. 1784, Orangeburg County, S. C., Fish Hatchery** (June 9, 1960, 86th Congress, Second Session, Report from the Committee on Merchant Marine and Fisheries to accompany S. 2053), 4 pp., printed. The purpose of the bill is to provide for a needed increase in facilities for the production of warm water fish in South Carolina. This would be accomplished by accepting title by the Secretary of the Interior to an existing hatchery facility owned by Orangeburg County, S. C., and its development by the Fish and Wildlife Service. Report discusses purpose, background, cost, and need for legislation; presents the Interior Department report on the bill. Committee reported favorably on the bill without amendment.

**FISHING VESSEL MORTGAGE INSURANCE FUND:** On June 9, 1960, the House Committee on Merchant Marine and Fisheries submitted Rept. No. 1785 on S. 2481, an act to continue the application of the Merchant Marine Act of 1936, as amended, to certain functions relating to fishing vessels transferred to the Secretary of the Interior, and for other purposes, without amendment; referred to the Committee of the Whole House on the State of the Union.

**FOREIGN TRADE STUDY COMMISSION:** S. J. Res. 208 (Dirksen), joint resolution introduced in Senate on June 13, 1960, to provide for a commission to study and report on the influence of foreign trade upon business and industrial expansion in the United States; to the Committee on Interstate and

Foreign Commerce. Resolution provides that commission shall file a final report not later than July 31, 1961.

**HAWAII OMNIBUS ACT:** Hawaii Omnibus Bill (Hearings before the Committee on Interior and Insular Affairs, United States Senate, 86th Congress, Second Session on S. 3054, April 29, 1960), 86 pp., printed. The purpose of the legislation is to "gather up the loose ends" in Federal legislation involved in the transition of Hawaii from a territory to a State of the United States; will make technical changes in our national laws to make Hawaii a full and equal partner with the other 49 states. Section 13 contains perfecting amendments to the statute, which authorizes the Secretary of the Interior to undertake exploration, investigation, development, and maintenance projects for fishery resources in the Pacific. Inappropriate references to "the Territory" of Hawaii and to the "Hawaiian Islands" would be deleted or modified by the amendments. Report contains statements and communications from Federal officials, Congressmen, and officials of business firms; the text of the bill; the report of the Bureau of the Budget; and a section by section analysis.

**IMPORTS IMPACT ON SMALL BUSINESS:** The Subcommittee on Relations of Business with Government of the Senate Select Committee on Small Business held hearings on June 16, on the subject of the impact of imports on American small business. Government witnesses were heard, as well as numerous public witnesses representing various segments of industry and several organizations. Hearings were adjourned subject to call.

**INTERIOR DEPARTMENT APPROPRIATIONS:** On May 5, 1960, the House adopted by a voice vote the conference report on H. R. 10401, a bill making appropriations for the Department of the Interior and related agencies for fiscal year 1961, and sent the legislation to the Senate. Two Senate amendments were reported in disagreement on which the House voted to recede and concur therein.

The President signed H. R. 10401 on May 13, 1960 (P. L. 86-455).

**H. Rept. No. 1571, Department of the Interior and Related Agencies Appropriation Bill, 1961** (May 3, 1960, 86th Congress, Second Session, Report of the Committee on Conference, to accompany H. R. 10401), 8 pp., printed. The two Houses disagreed on the amendments of the Senate to H. R. 10401, appropriations for the Department of the Interior and related agencies for the fiscal year ending June 30, 1961, and for other purposes. The Committee on Conference agreed to recommend to their respective Houses various amendments, among which Amendment No. 24 pertains to the Bureau of Commercial Fisheries: Appropriates \$6,591,000 for management and investigations of resources instead of \$7,051,000 as proposed by the Senate and \$6,249,000 as proposed by the House. The increase provided over the House bill is for the following: pesticides research, \$67,000; industrial fisheries research (menhaden, sardines, and herring), \$175,000; South Atlantic exploratory fishing gear and development program, \$100,000. In addition, the conferees direct that \$60,000 be made available for this latter program from Saltonstall-Kennedy funds to make a total of \$160,000 available

during fiscal year 1961. For the Bureau of Sport Fisheries and Wildlife Amendment 22 appropriates \$18,645,000 for management and investigations of resources instead of \$18,770,000 as proposed by the Senate and \$18,220,000 as proposed by the House. The increase provided over the House bill is as follows: Assistance to Navajo, Hopi, Fort Apache, and Zuni Indian Reservations in fishery management, \$25,000; research on effects of pesticides on fish and wildlife, \$250,000; and marine sport fisheries research, \$150,000. Amendment No. 23 appropriated \$4,535,000 for construction instead of \$4,841,000 as proposed by the Senate and \$3,485,000 as proposed by the House. The increase provided over the House bill is for the following hatcheries: Alchesay Springs, Ariz., \$260,000; Garrison Dam, N. Dak., \$200,000; Corning, Ark., \$100,000; Erwin, Tenn., \$100,000; Creston, Mont., \$130,000; Gavins Point Dam, S. Dak., \$150,000; Hot Springs, N. Mex., \$100,000; and for a survey, Walker Lake area, Nevada, \$10,000.

**LAW OF THE SEA CONVENTIONS:** By a record vote the Senate on May 26, 1960, ratified en bloc five treaties, all from 86th Congress, 1st Session: Convention on the Territorial Sea and the Contiguous Zone (Ex. J); Convention on the High Seas (Ex. K); Convention on Fishing and Conservation of the Living Resources of the High Seas (Ex. L); Convention on the Continental Shelf (Ex. M); and Optional Protocol of Signature Concerning Compulsory Settlement of Disputes on Law of the Sea (Ex. N). Following objections of several Senators to the voting en bloc of these treaties, another vote was taken on Optional Protocol of Signature Concerning Compulsory Settlement of Disputes on Law of the Sea (Ex. N), the Senate failed to agree to resolution of ratification of that treaty. An affirmative two-thirds vote is necessary for ratification. So the Senate, in essence, rejected the Optional Protocol which would give the World Court jurisdiction over all disputes arising under the Law of the Sea Convention signed at Geneva.

The four conventions that were ratified codify existing international law and establish some new international law with respect to activities on the seas.

On May 27, 1960, a motion was made by Senator Mansfield to reconsider the vote by which the resolution approving ratification of Ex. N., 86th Congress, 1st Session, was disagreed to. The motion to reconsider permits debate and full explanation and clarification of Ex. N.

**NATIONAL AQUARIUM IN DISTRICT OF COLUMBIA:** H. R. 12634 (Kirwin), introduced in the House on June 14, 1960, a bill to authorize the Secretary of the Interior to construct a national aquarium in the District of Columbia; referred to the Committee on the District of Columbia.

**NATIONAL FISHERIES CENTER:** H. R. 9979 (Foley), a bill to create a Federal planning commission to conduct a study of the possible establishment of a national fisheries center in the District of Columbia; to the Committee on the District of Columbia; introduced in House January 27, 1960. Identical to other bills previously introduced.

**OCEANOGRAPHIC NATIONAL DATA CENTER:** H. R. 12018 (George P. Miller) on May 2, 1960, In-

troduced in the House a bill to establish within the U. S. Coast and Geodetic Survey a National Oceanographic Data Center and a National Instrumentation Test and Calibration Center; to the Committee on Merchant Marine and Fisheries.

**OCEANOGRAPHY** (Hearing before the Special Subcommittee on Oceanography of the Committee on Merchant Marine and Fisheries, House of Representatives, 86th Congress, 2nd Session, on S. 2482, to remove geographical limitations on activities of the Coast and Geodetic Survey, and for other purposes; and S. 2483, to provide flexibility in the performance of certain functions of the Coast and Geodetic Survey, and of the Weather Bureau, January 22, 1960, 35 pp., printed. Contains statements of government officials; letters and resolutions of various organizations. This legislation would advance the marine sciences and enlarge the abilities of the Coast and Geodetic Survey to enable it to conduct surveys in waters which extend beyond the immediate territories of the United States set forth in existing Coast and Geodetic Survey authority; and would simplify the administrative action of the Coast and Geodetic Survey and Weather Bureau, authorizing the Secretary of Commerce to fix certain rates of pay for extra compensation for members of crews of vessels when assigned to certain duties and to employees of other agencies when performing certain duties for the Coast and Geodetic Survey.

**OCEANOGRAPHIC RESEARCH PROGRAM:** On May 18, 1960, the Senate Committee on Interstate and Foreign Commerce in executive session, ordered favorably reported without amendment S. 2692 (Magnuson & 10 other Senators), a bill introduced in the Senate on September 11, 1959. The purpose of the bill is to advance the marine sciences, to establish comprehensive 10-year program of oceanographic research and surveys; to promote commerce and navigation, to secure the national defense; to expand ocean resources; to authorize the construction of research and survey ships and facilities; to assure systematic studies of the effects of radioactive materials in marine environments; to enhance the general welfare, and for other purposes. Titled "The Marine Sciences and Research Act of 1959" the bill provides for a 10-year program relating to Oceanographic Research and objectives expressed in Senate Resolution 136, previously introduced and adopted by Senate. Report No. 1525 was reported by the Committee on Interstate and Foreign Commerce, with amendments on June 7, 1960.

**Marine Science** (Hearings before the Committee on Interstate and Foreign Commerce United States Senate, 86th Congress, Second Session, on S. 2692, April 20, 21, and 22, 1960, 165 pp., printed. Contains statements, letters, communications, reports, resolutions, and tables from various government and state agencies, commissions, universities, laboratories, etc. The Bureau of Commercial Fisheries, Fish and Wildlife Service, submitted 3 tables: Table 1 - research contracts either negotiated or in effect in fiscal year 1960; Table 9 - contracts negotiated with Saltonstall-Kennedy Act funds, fiscal years 1955-60; Table 12 - contracts utilizing Saltonstall-Kennedy Act funds (analysis by contracting organization and location).

**OCEANOGRAPHY EDUCATIONAL ASSISTANCE:** Frontiers in Oceanic Research (Hearings before the Committee on Science and Astronautics, U. S. House of Representatives, 86th Congress, Second Session, April 28 and 29, 1960, on H. R. 6298), 76 pp., printed. This legislation provides financial assistance to educational institutions for the development of teaching facilities, provides fellowships in the field of oceanography, and provides fellowships for graduate study in such fields. Contains statements of a geochemistry professor, California Institute of Technology, and Chairman, Committee on Oceanography, National Academy of Sciences; Director of Development Planning, Lockheed Aircraft Corporation, Burbank, California; the scientist in charge of the Navy's bathyscope program; and the Assistant Secretary of the Navy for Research and Development.

**POLLUTION OF THE SEA BY OIL:** Executive C, 86th Congress, Second Session, was reported from the Committee on Foreign Relations on June 2, 1960. The International Convention for the Prevention of Pollution of the Sea by Oil, 1954, was signed at London, on May 12, 1954, in behalf of certain states, but not the United States (Ex. Rept. No. 5). This Convention would help clean up the ocean oil pollution which annually kills thousands of water birds, fish, shellfish, and other wildlife.

**PUBLIC WORKS APPROPRIATION BILL, 1961:** The Committee on Appropriations held an additional hearing on H. R. 12326 (Cannon), a bill introduced in the House on May 20, 1960, fiscal 1961 appropriations for public works. This legislation includes funds for the Fish and Wildlife Service for studies on effect of certain public works construction on fish and wildlife; Lower Columbia River fish sanctuary program; and also, the Committee requested that consideration be given to transferring the Columbia Fisheries Program under Public Works Appropriations to the budget for the Fish and Wildlife Service.

**Public Works Appropriation Bill, 1961** (Hearings before the Subcommittee of the Committee on Appropriations, House of Representatives, 86th Congress, Second Session, Part 2), 98 pp., printed. Contains statements of public officials; project data sheets; tables; and details of projects. Nearly each project lists funds for studies of effect of project upon fish and wildlife. Includes funds (\$750,000) to permit detailed studies by the Fish and Wildlife Service of 191 Corps of Engineers and the Bureau of Reclamation projects in the United States, exclusive of the Missouri River Basin. These studies are provided for in the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U. S. C. 661 et seq.) which require that the Fish and Wildlife Service determine the probable effects on fish and wildlife resources of water control projects proposed under the jurisdiction or control of the Federal Government and to insure that wildlife conservation shall receive equal consideration and be coordinated with other features of water-resource development programs. Measures are recommended to protect and, where possible, to develop and improve fish and wildlife. The act authorizes transfer of funds for these studies to the Fish and Wildlife Service from moneys appropriated to the Federal construction agencies for investigations, engineering, or construction. Each project and its cost for fish and wildlife study is listed.

H. R. 12326 (Cannon), introduced in the House on May 20, 1960, a bill making appropriations for civil functions administered by the Department of the Army, certain agencies of the Department of the Interior, the Atomic Energy Commission, the Tennessee Valley Authority and certain study commissions, for the fiscal year ending June 30, 1961, and for other purposes. This bill was reported without amendment on May 20, 1960 (H. Rept. No. 1634).

H. Rept. No. 1634, Public Works Appropriation Bill, 1961 (May 20, 1960, 86th Congress Second Session, Report from the Committee on Appropriations to accompany H. R. 12326), 45 pp., printed. This legislation includes funds for the Fish and Wildlife Service for studies on effect of certain public works construction on fish and wildlife, \$500,000; Lower Columbia River fish sanctuary program, \$1,400,000. Also, the Committee requested that consideration be given to transferring the Columbia Fisheries Program under Public Works Appropriations to the budget for the Fish and Wildlife Service.

The Committee of the Whole House on the State of the Union concluded consideration of H. R. 12326 on May 24, 1960, but deferred final action on the bill until May 25, 1960, upon development of a record vote on a motion to recommit the bill. The re-committal motion was designed to prevent use of any funds for construction of the Allegheny River Reservoir in Pennsylvania and New York. No amendments were adopted. On May 25, 1960, the bill passed the House with Allegheny River Reservoir included and was sent to the Senate. Was referred to Senate Committee on Appropriations.

**SALMON IMPORT RESTRICTIONS:** Hearings by the Subcommittee on Merchant Marine and Fisheries of the Senate Committee on Interstate and Foreign Commerce continued hearings on May 18, 1960, on S. 502, a bill introduced in Senate January 20, 1959, to facilitate the application and operation of the Fish and Wildlife Act of 1956, and for other purposes.

**SALTONSTALL-KENNEDY ACT FUNDS RE-APPORTIONMENT:** H. R. 12141 (Coffin), introduced in House on May 10, 1960, a bill to amend the Act of August 11, 1938, with respect to the allocation of funds available under that Act, and for other purposes. The Act entitled "An Act to authorize the Federal Surplus Commodities Corporation to purchase and distribute surplus products of the fishing industry," as amended, is further amended. It would allow the Secretary of the Interior, after deducting 8 percentum for his expenses in the conduct of necessary investigations, administration, and execution of this Act, to allocate funds for the purposes mentioned in this section to the agencies, organizations, and individuals mentioned in this section as follows: (1) one-third in the form of grants; (2) one-third in the form of contracts; and (3) one-third for apportionment on an equitable basis, as the Secretary of the Interior may determine, among the several states. In making such apportionments the Secretary of the Interior shall take into account the extent of the fishing industry within each state as compared with the total fishing industry of the United States and such other factors as may be relevant in view of the purposes of this section.

Any state desiring to avail itself of the benefits of this section shall, through its state fisheries department, submit to the Secretary of the Interior full and detailed statements of any project proposed for that state. If the Secretary of the Interior finds that such project is consistent with the purposes of this section, and meets with standards to be established by him and otherwise approves such project, the state fisheries department shall furnish him such detailed surveys, plans, specifications, and estimates with respect to such project as he may request. If the Secretary of the Interior approves such detailed surveys, plans, specifications, and estimates, he shall so notify the state fisheries department. No part of any moneys apportioned under this subsection shall be paid with respect to any project until the detailed surveys, plans, specifications, and estimates have been approved by the Secretary of the Interior, and not more than 50 percent of the total estimated cost of the approved project shall be paid from funds made available under this section. If any funds made available for an approved project under this section are not used by the state for that project, that state shall not receive any further funds under this section until it shall have replaced the misappropriated funds. Allocation to the states would be based on a formula involving the volume and value of their fisheries and the number of fishermen engaged in the fishing industry. Also, each state would be required to match the funds approved for use of that state. The amendment would take effect July 1, 1961.

This bill is identical to H. R. 12142 (Anfuso), H. R. 12143 (Lennon), H. R. 12144 (Geo. P. Miller), H. R. 12145 (Oliver), H. R. 12146 (Pelly), and H. R. 12147 (Thompson of Louisiana)--all introduced in the House on May 10, 1960; similar but not identical to H. R. 10839 (Rivers of Alaska), introduced in House on March 7, 1960. H. R. 12215 (McIntire), introduced in the House on May 12, 1960, identical to seven bills introduced in House on May 11, 1960, and similar to one on March 7, 1960.

S. 3658 (Gruening, for himself and Magnuson, Jackson, Morse, Lusk, and Engle), introduced in the Senate on June 10, 1960, a bill to amend the act authorizing the use for fishery research and other purposes of 30 percent of amounts collected as custom duties on fishery products in order to increase such percentage to 60; to the Committee on Interstate and Foreign Commerce.

While the bill contains no stipulation on how additional funds available under the expanded program would be spent, Senator Gruening states in a speech in the Senate that the purpose of the bill is to provide additional funds "for the rehabilitation of the salmon fishing resources of the Pacific Northwest, particularly those in Alaska."

**SHRIMP CONSERVATION CONVENTION WITH CUBA:** S. 2867 (Magnuson), introduced in the Senate January 20, 1960, a bill to give effect to the Convention between the United States and Cuba for the conservation of shrimp, signed at Havana, August 15, 1958; was reported to the Senate by the Committee on Interstate and Foreign Commerce on May 12, 1960 (S. Rept. No. 1346).

**S. Rept. No. 1346, Shrimp Conservation Act** (May 12, 1960, 86th Congress, Second Session, Report from the Committee on Interstate and For-

ign Commerce, to accompany S. 2867), 7 pp., printed. The bill, which was introduced at the request of the Department of State, would implement a convention for the conservation of shrimp between the United States and Cuba, signed at Havana, August 15, 1958. The Senate gave its advice and consent to the ratification of the convention, June 4, 1959.

The Commission for the Conservation of Shrimp, to be established by the convention, will have two national sections, each composed of three members appointed by the respective Governments. Each section will have one vote, and both must approve any decisions of the Commission. Each Government may establish an advisory committee for its national section. The Commission will have two principal duties: First it will obtain and disseminate scientific information regarding stocks of shrimp of common concern in the convention area. Secondly, on the basis of its findings, it will adopt appropriate regulations which will enter into force 50 days after notification to the parties, in the absence of objection by either party.

Share of the joint expenses of the Commission will be determined by the proportion of the total shrimp catch from the convention area by vessels belonging to the respective countries. Initially the United States would have the largest share of the expense, but Cuba's share will be expected to increase.

Enforcement of the legislation would be by the Coast Guard, Department of the Interior, Bureau of Customs, or Federal officers and employees designated so to act by the Secretary of the Interior. Judges of the U. S. District Courts and the U. S. Commissioners, within their jurisdiction, would be authorized to issue warrants or other process necessary to enforce the legislation. Shrimp and gear used to take same in violation of this proposed act, could be seized, and persons in violation could be fined up to \$5,000 for the first offense and up to \$10,000, and catch and gear ordered forfeited. Committee amendment changes the "Shrimp Conservation Act of 1959," to "Shrimp Conservation Act of 1960." Despite recent occurrences in Cuba, the Department of State still favors the enactment of this legislation. The committee points out that this is a matter of an economic nature between the two countries, and should not be evaluated on any other basis. Report contains letters from various agencies stating their approval of the enactment of this legislation.

On May 26, 1960, the Senate considered S. 2867, a bill which had been reported out by the Committee on Interstate and Foreign Commerce with an amendment. The amendment was agreed to, the bill was read for the third time, and passed.

**SHRIMP IMPORT DUTIES:** The Commissioners Court of Brazoria County, Tex., on April 11, 1960, and the Propeller Club of the United States, Port of Brownsville and Port Isabel, Tex., on February 18, 1960, sent resolutions to the Senate urging congressional passage of pending bills establishing country-by-country quotas on shrimp imports (S. 3204 and H. R. 8769).

**S. 3639** (Long, and others), a bill for the relief of the domestic shrimp industry, introduced in the

Senate on June 7, 1960, and referred to the Committee on Finance. The purpose of this legislation is to grant temporary quotas to meet distressed conditions in the domestic shrimp industry.

**SMALL BUSINESS ACT AMENDMENTS:** S. 3698 (Proxmire, for himself, Sparkman, Hart, Fulbright and Capehart), by unanimous consent, on June 16, 1960, introduced bill to amend the Small Business Act, and for other purposes; referred to the Committee on Banking and Currency. This legislation would increase by \$75 million the authorization for the revolving fund for the Small Business Administration's regular business loan program.

**SMALL BUSINESS INVESTMENT ACT OF 1958 AMENDMENTS:** On May 14, 1960, S. 2611, a bill which was introduced in the Senate on August 27, 1959, to amend the Small Business Investment Act of 1958, and for other purposes, was reported with amendments by the Committee on Banking and Currency and committed to the Committee of the Whole House on the State of the Union (H. Rept. 1608). The legislation provides for amendments to the Small Business Act of 1958 (P. L. 85-833), for the purpose of removing certain legal impediments to the formation and successful operation of small business investment companies. Passed House amended June 6, 1960. After concurring to House amendments, the Senate cleared for President S. 2611 (Proxmire). Approved and signed by the President on June 11, 1960 (P. L. 86-502).

H. Rept. No. 1608, Small Business Investment Act Amendments of 1960 (May 14, 1960, 86th Congress, Second Session, Report of the Committee on Banking and Currency to accompany S. 2611), 12 pp., printed. Contains purpose and provisions of the bill; committee recommendations; names, locations, and capital structure of licensed Small Business Investment Companies; section by section summary of the bill and amendments. The purpose of this legislation is to remove certain legal impediments to the formation and successful operation of small business investment companies.

**SPORT FISHING ORGANIZATIONS MAIL RATE EXTENSION:** H. R. 12333 (Johnson of Maryland), introduced in the House on May 23, 1960, a bill to extend to nonprofit sport fishing or fishing fair or contest organizations and associations the third-class mail rates applicable to certain categories of nonprofit organizations or associations; to the Committee on Post Office and Civil Service.

**TARIFF NEGOTIATIONS:** H. Con. Res. 697 (Hiestand), introduced on June 1, a concurrent resolution expressing the sense of Congress that the United States should not grant further tariff reductions in the forthcoming tariff negotiations under the provisions of the Trade Agreements Extension Act of 1958, and for other purposes; to the Committee on Ways and Means. H. Con. Res. 699, introduced in the House on June 13, is similar to H. Con. Res. 697.

**TARIFF REDUCTIONS AND WAGE DIFFERENTIALS:** S. Con. Res. 110 (Bush), introduced in Senate on June 14, 1960, a concurrent resolution relative to consideration of certain tariff reductions and wage differentials at the coming GATT Conference; referred to the Committee on Finance.

**UNEMPLOYMENT RELIEF IN DEPRESSED AREAS:** On May 6, 1960, the Senate adopted a motion by Johnson (Texas), to agree to the House amendment to S. 722, a bill to establish an effective program to alleviate conditions of unemployment and underemployment in certain economically depressed areas. This action cleared the bill for the President.

On May 9, 1960, the Secretary of the Senate presented to the President of the United States for signature S. 722. The President vetoed S. 722 on May 13, 1960. On May 24, 1960, the Senate debated and voted to override the Presidential veto. This attempt was defeated because a two-thirds affirmative vote, which is necessary to override a Presidential veto, was not polled.

**WAGES--MINIMUM HOURLY RATE INCREASE:** The Subcommittee on Labor Standards of the House Committee on Education and Labor met in Executive session on May 31, 1960, to mark-up H. R. 4488 (Roosevelt), introduced on February 16, 1959, a bill to amend the Fair Labor Standards Act of 1938 to establish a \$1.25 minimum hourly wage, and for other purposes.

**Minimum Wage-Hour Legislation** (Hearings before the Subcommittee on Labor Standards of the Committee on Education and Labor, House of Representatives, 86th Congress, Second Session, on various bills regarding minimum wage legislation, March 16, 17, 23, 24, 29, 30, 31, and April 7, 11, and 13, 1960 - Part I, 490 pp., printed. Contains statements and letters of union leaders; industry officials; employers and employees in various industries; government officials; and various exhibits, charts, and tables. Sixty-seven bills have been introduced in Congress, all dealing with the same subject matter, and generally to the same extent. This legislation is designed to substantially increase the Federal minimum wage and extend the coverage of the Fair Labor Standards Act of 1938 to include some 20 million workers who are not now covered. One of the bills, H. R. 4488, would eliminate minimum wage and overtime exemptions for employees "in packing, canning, or other processing of fish or seafood products (but fishing and other occupations which precede processing of such products continue to be exempt)."

**Minimum Wage-Hour Legislation** (Hearings before the Subcommittee on Labor Standards of the Committee on Education and Labor, U. S. House of Representatives, 86th Congress, Second Session, on various bills regarding minimum wage legislation, April 19, 20, 21, 26, 27, and May 3 and 5, 1960 - Part II, 948 pp., printed. Contains letters, prepared statements and supplemental material of labor officials; industry officials; government and state officials; and various charts, exhibits, and tables.

**WAGES--MINIMUM HOURLY RATE INCREASE:** H. R. 12677 (Roosevelt), introduced on June 15, 1960, a bill to amend the Fair Labor Standards Act of 1938, as amended, to provide coverage for employees of large enterprises engaged in retail trade or service and of other employers engaged in activities affecting commerce, to increase the minimum wage under the Act of \$1.25 an hour, and for other purposes; to the Committee on Education and Labor.

The Senate Committee on Labor and Public Welfare continued its executive consideration of S. 1046 (Kennedy and others), introduced in the Senate February 16, 1959, a bill proposing amendments to the Fair Labor Standards Act, but did not conclude action, and on June 15 recessed subject to call. Committee has removed the fishery exemption from the bill, except that seafood processing and canning have retained the overtime exemption.

The House Committee on Education and Labor continued on June 15 in executive session consideration of H. R. 4488 (Roosevelt), introduced in the House on February 16, 1959, a bill to amend the Fair Labor Standards Act of 1938 in regard to increasing the Federal minimum wage to \$1.25 an hour.

On June 16, 1960, the House Committee on Education and Labor met in executive session and ordered favorably reported to the House H. R. 12677. The bill retains existing year-round exemption from overtime for fish cannery and increases statutory minimum wage to \$1.15 an hour on November 1 this year, to \$1.20 an hour on November 1, 1961, and to \$1.25 an hour on November 1, 1962; also would continue wage order program for employees in Puerto Rico, the Virgin Islands, and American Samoa, and would provide for increases in their wages reflecting the same percentage as the annual increases on the mainland. The general fishery exemption in the bill is the same as in present law except for a few words. The bill provides that "any employee employed in or necessary to the conduct of the catching, taking, harvesting, cultivating, or farming of any kind of fish, shellfish, crustacea, sponges, seaweeds, or other aquatic forms of animal and vegetable life, including the going to and returning from work and including employment in or necessary to the conduct of the loading, unloading, or packing of such products for shipment or in propagating, processing (other than canning), marketing, freezing, curing, storing, or distributing the alive products or byproducts thereof; . . ." is exempt

from Sections 6 and 7 of the Act. In addition, the bill also provides that "any employee employed in the canning of any kind of fish, shellfish, or other aquatic forms of animal or vegetable life; or any by-product thereof; . . ." is exempt from Section 7 of the Act.

**WATER CONSERVATION ACT OF 1959: Policy and Procedure for the Development of Water Resources** (Hearing before the Committee on Public Works, House of Representatives, 86th Congress, Second Session on H. R. 8, April 27, 1960), Part 2, 315 pp., printed. The bill H. R. 8, introduced in the House on January 7, 1959, would promote and establish policy and procedure for the development of water resources of lakes, rivers, and streams. The report on the hearing contains statements of members of Congress, various public officials, and public utility officials. Among other things, this legislation provides that the development of water resources by the United States shall be based upon adequate and reliable data and shall be so planned and prosecuted on a comprehensive multiple-purpose basis to achieve maximum sustained usefulness of resources for all beneficial purposes; to protect and promote commerce among the several states, and the general welfare, security, and defense of the United States.

**WILDLIFE, FISH, AND GAME CONSERVATION:** A Special Subcommittee hearing was held on May 19, on H. R. 2565, a bill which was introduced in the House on March 23, 1960, to promote effectual planning, development, maintenance, and coordination of wildlife, fish, and game conservation and rehabilitation in military reservations.

On May 27, 1960, the Senate Committee on Interior and Insular Affairs submitted Report No. 1492 on H. R. 2565.

H. R. 2565, was passed over by the Senate, by the request of New York State authorities, on June 2, 1960.




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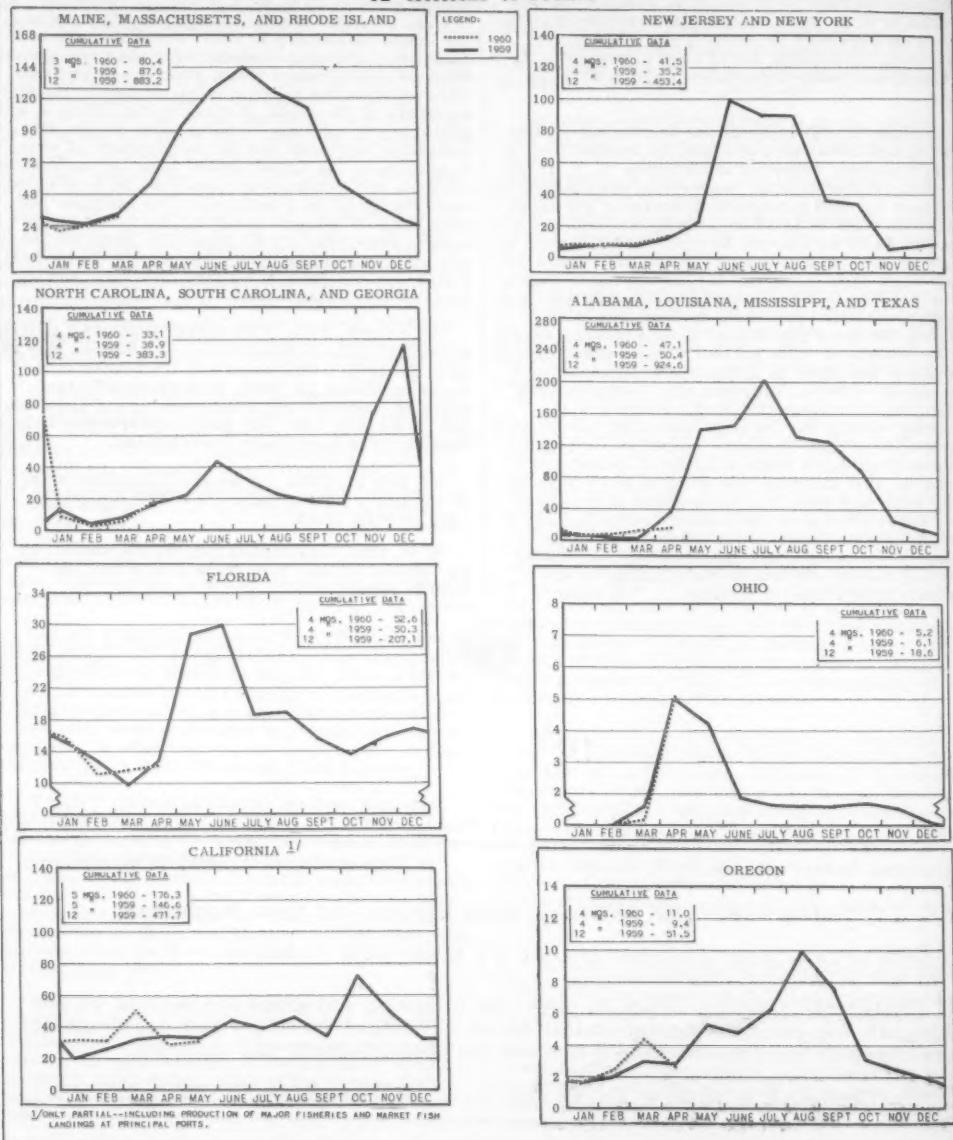
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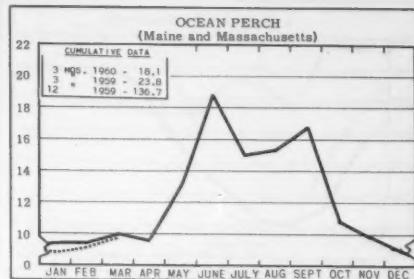
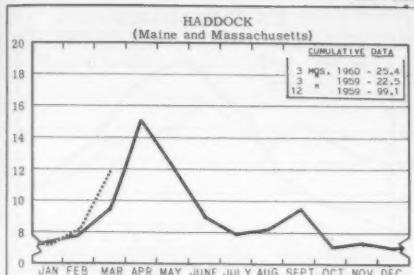
# FISHERY INDICATORS

**CHART I - FISHERY LANDINGS for SELECTED STATES**  
In Millions of Pounds

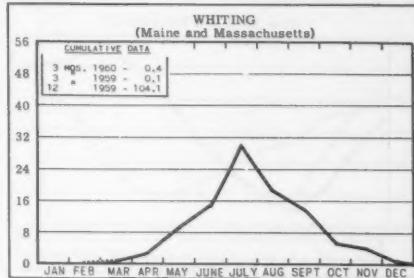
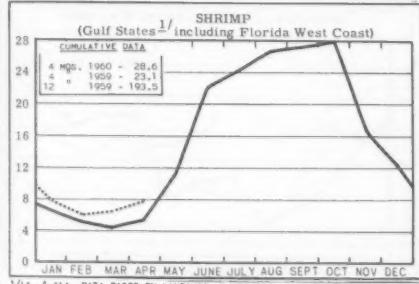


## CHART 2 - LANDINGS for SELECTED FISHERIES

In Millions of Pounds

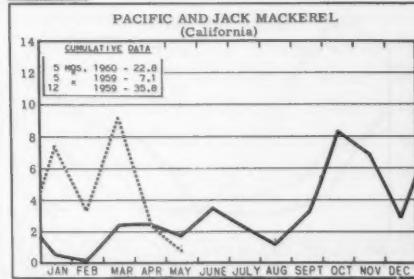
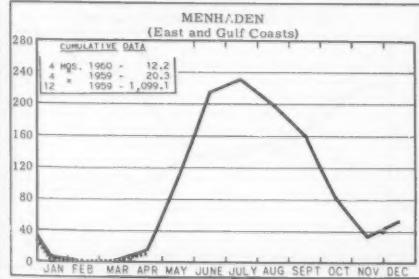


In Millions of Pounds

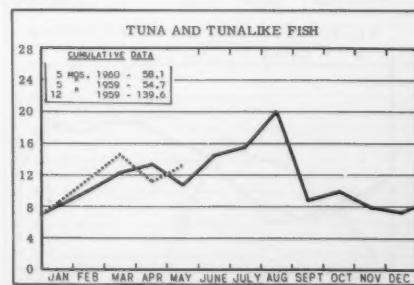
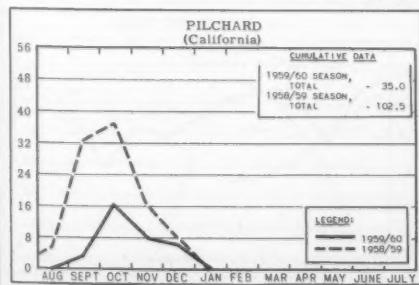


<sup>1/</sup>LA. & ALA. DATA BASED ON LANDINGS AT PRINCIPAL PORTS AND ARE NOT COMPLETE.

In Thousands of Tons

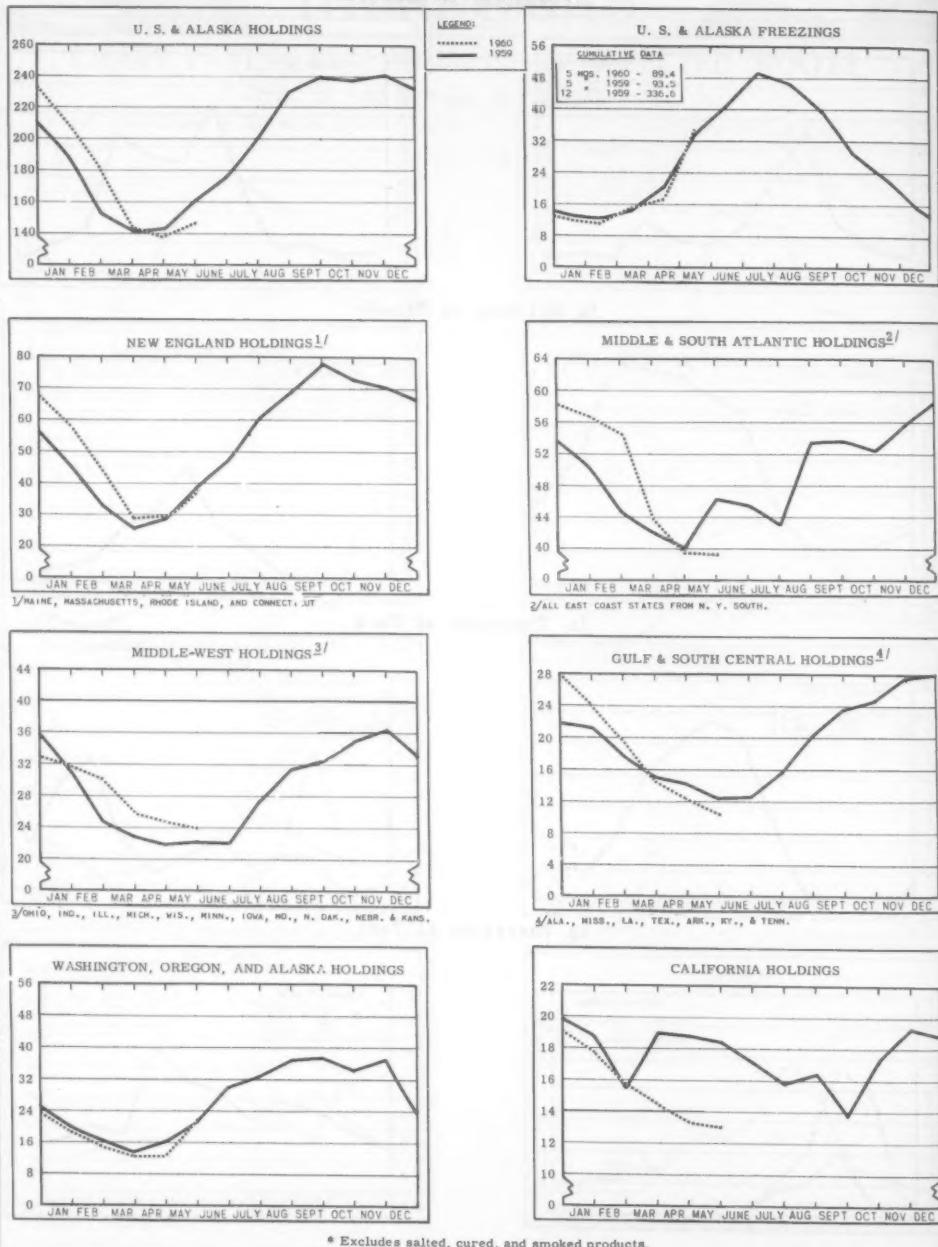


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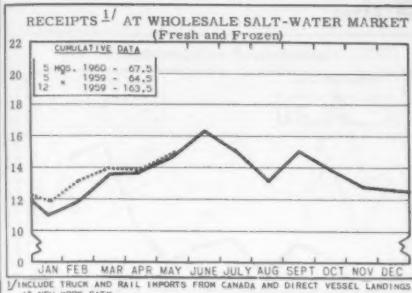
### CHART 3 - COLD-STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS \*

In Millions of Pounds

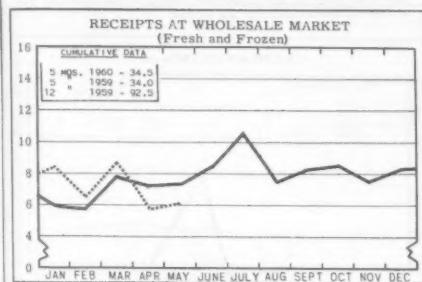
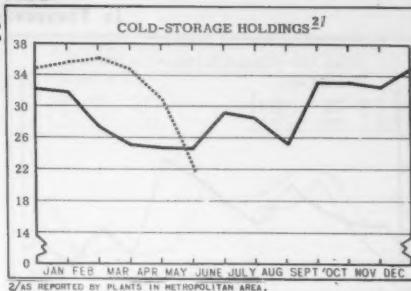


## CHART 4 - RECEIPTS and COLD-STORAGE HOLDINGS of FISHERY PRODUCTS at PRINCIPAL DISTRIBUTION CENTERS

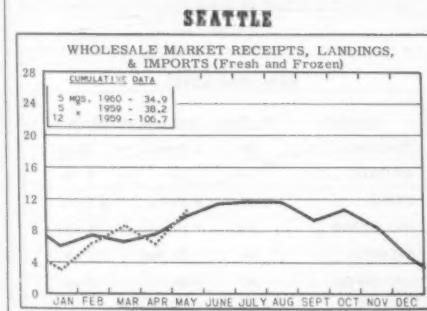
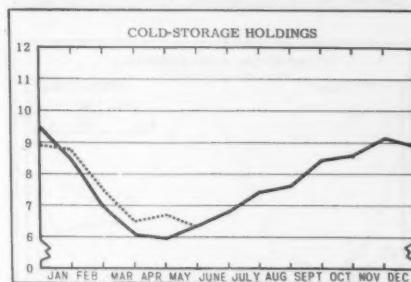
In Millions of Pounds



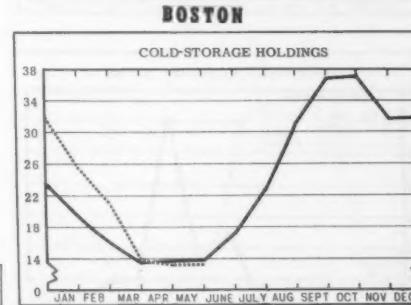
NEW YORK  
CITY



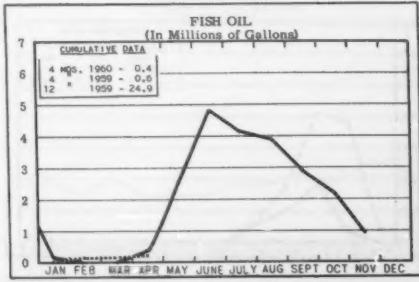
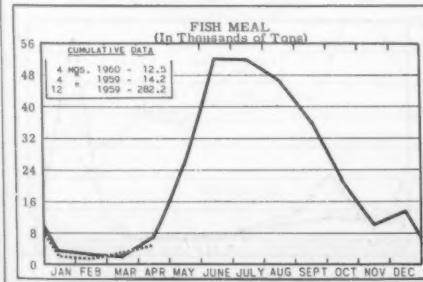
CHICAGO



LEGEND:  
----- 1960  
— 1959

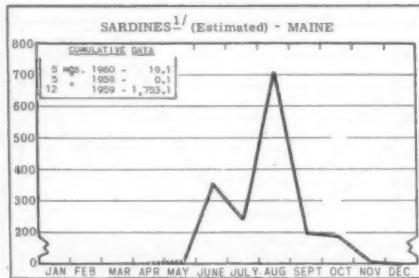
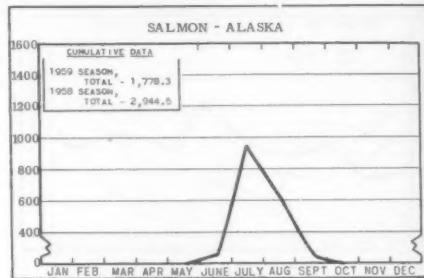
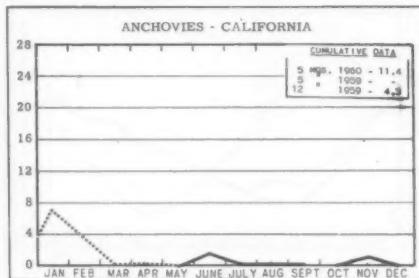
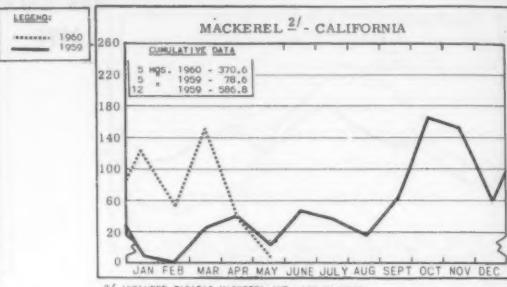
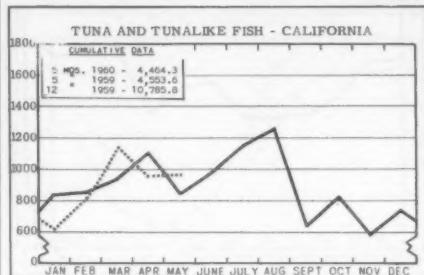


## CHART 5 - FISH MEAL and OIL PRODUCTION - U.S and ALASKA



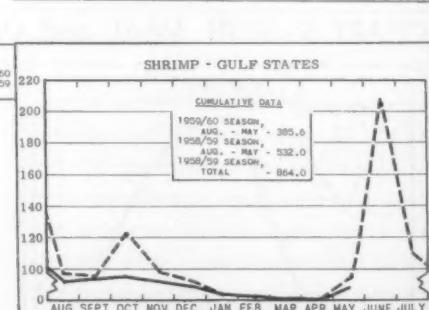
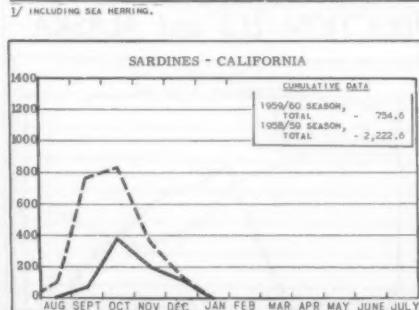
## CHART 6 - CANNED PACKS of SELECTED FISHERY PRODUCTS

In Thousands of Standard Cases



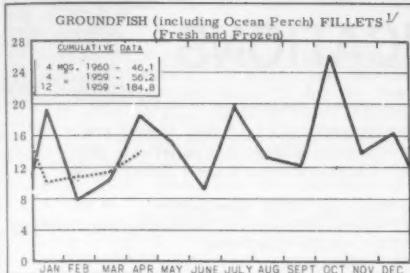
**STANDARD CASES**

Variety	No. Cans	Designation	Net Wgt.
SARDINES.....	100	½ drawn	3½ oz.
SHRIMP.....	48	--	5 oz.
TUNA.....	48	# ½ tuna	6 & 7 oz.
PILCHARDS...	48	# 1 oval	15 oz.
SALMON.....	48	1-lb. tall	16 oz.
ANCHOVIES...	48	½-lb.	8 oz.



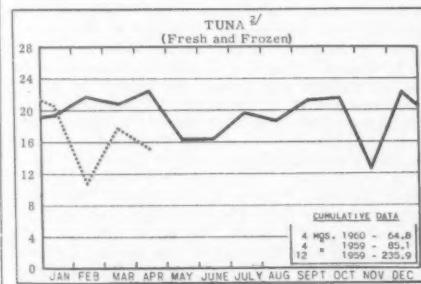
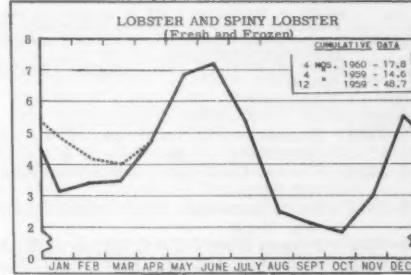
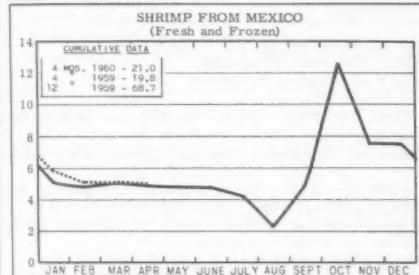
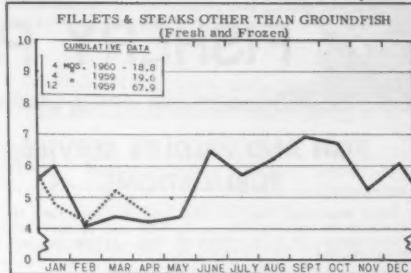
## CHART 7 - U.S. FISHERY PRODUCTS IMPORTS

**In Millions of Pounds**

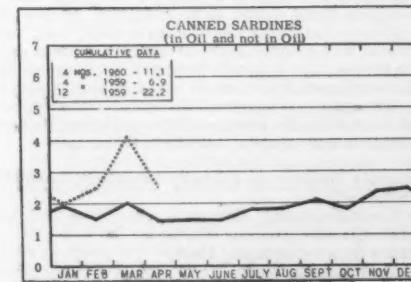
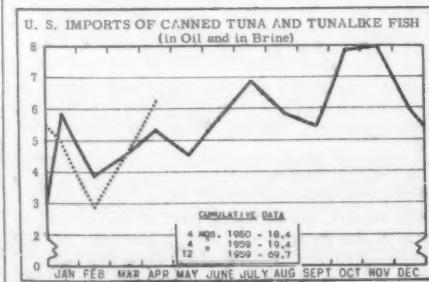
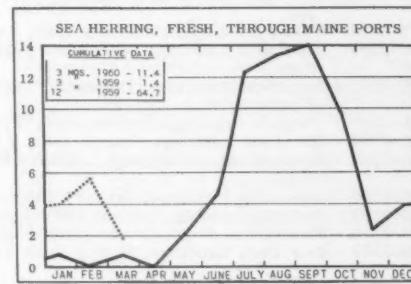


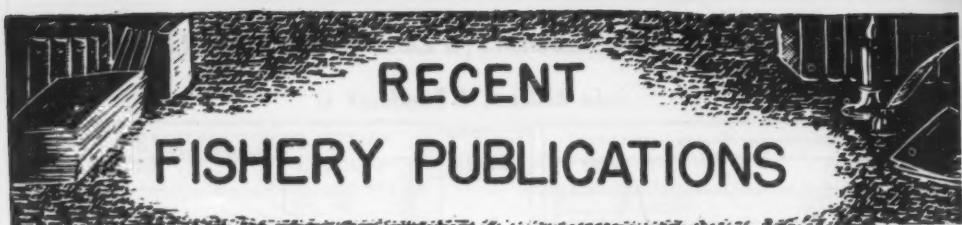
<sup>1/</sup>SINCE SEPTEMBER 15, 1959, FISH FILLET BLOCKS ARE CLASSIFIED UNDER A DIFFERENT CATEGORY THAN FILLETS; THEREFORE, 1959 DATA ARE NO LONGER COMPARABLE WITH 1960.

LEGEND:  
----- 1960  
— 1959



<sup>2/</sup> EXCLUDES LOINS AND DISCS.





# RECENT FISHERY PUBLICATIONS

## FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE DIVISION OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON, 25 D. C. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

- CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES AND ALASKA.
- FL - FISHERY LEAFLETS.
- SL - BRANCH OF STATISTICS LISTS OF DEALERS IN AND PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.
- SSR. - FISH, SPECIAL SCIENTIFIC REPORTS—FISHERIES (LIMITED DISTRIBUTION).
- SEP. - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.

Number	Title
CFS-2246	- Massachusetts Landings, 1959 Annual Summary, 16 pp.
CFS-2250	- Florida Landings, 1959 Annual Summary, 10 pp.
CFS-2256	- Maine Landings, 1959 Annual Summary, 11 pp.
CFS-2268	- Frozen Fish Report, March 1960, 8 pp.
CFS-2289	- Alabama Landings, 1959 Annual Summary, 3 pp.
CFS-2292	- New York Landings, February 1960, 4 pp.
CFS-2294	- Texas Landings, February 1960, 3 pp.
CFS-2295	- Louisiana Landings, November 1959, 2 pp.
CFS-2296	- Louisiana Landings, December 1959, 2 pp.
CFS-2297	- Virginia Landings, March 1960, 3 pp.
CFS-2298	- Maryland Landings, March 1960, 3 pp.
CFS-2300	- Massachusetts Landings, January 1960, 4 pp.
CFS-2302	- Louisiana Landings, January 1960, 2 pp.
CFS-2307	- Georgia Landings, March 1960, 2 pp.
CFS-2311	- Florida Landings, March 1960, 6 pp.
CFS-2313	- New York Landings, March 1960, 4 pp.
FL-393	- Fisheries of the United States, 1959 (A Preliminary Review), by E. A. Power, 52 pp., illus., revised April 1960. A preliminary review of commercial fishery activities in 1959, well illustrated with graphs and charts. In addition to data on production, consumption, prices, manufactured fishery products, value of industry and capital investments, and supplies of certain fishery products, this leaflet contains information on fishery imports and exports, and world fisheries.

Wholesale Dealers in Fishery Products, 1959 (Revised):
SL-7 - New Jersey, 1959.
SL-13 - North Carolina, 1959.
SL-14 - South Carolina, 1959.
SL-15 - Georgia, 1959.
SL-17 - Alabama (Coastal Area), 1959.

- SL-18 - Mississippi (Coastal Area), 1959.
- SL-26 - Illinois (Great Lakes Area), 1959.
- SL-27 - Indiana (Great Lakes Area), 1959.

Firms Canning, 1959 (Revised):

- SL-102 - Maine Sardines (Including Sea Herring).
- SL-102A - Pacific Sardines.
- SL-104 - Mackerel.
- SL-111 - Clam Products.
- SL-116 - Food for Animals, From Marine-Animal Products.

Firms Manufacturing, 1959 (Revised):

- SL-154 - Seaweed Products.
- SL-160 - Menhaden Products.

SSR-Fish. No. 292 - North Pacific and Bering Sea Oceanography, 1957, by Felix Favorite and Glenn M. Pedersen, 110 pp., illus., May 1959.

SSR-Fish. No. 312 - North Pacific and Bering Sea Oceanography, 1958, by Felix Favorite and Glenn Pedersen, 333 pp., illus., November 1959.

SSR-Fish. No. 327 - Herring of the North European Basin and Adjacent Seas (Translations from Russian), edited by Leslie W. Scattergood, 286 pp., illus., November 1959. Includes articles on "The Fundamental Stage of the Life-Cycle of Atlantic-Scandinavian Herring," by Y. Y. Marti; "Chart of Consonant Currents in the Norwegian and Greenland Seas," by A. P. Alekseev and B. V. Iosifov; "Plankton as an Indicator of Waters of Different Origins," by V. D. Abramova; "Seasonal Changes in Plankton and Feeding Migrations of Herring," by E. A. Pavshitski; "Data on the Food of the Atlantic Herring," by V. A. Rudokova; "Investigation into the Life-Cycle of Summer-Spawning Herring of Iceland," by K. A. Liamin; "The Ovogenesis and Ecology of the Sexual Cycle of the Murmansk Herring (*Clupea harengus harengus* L.)," by V. M. Naumov; "Experimental Tagging of Herring in Kandalaksha Bay in 1953-1954," by A. P. Vilson; and "The Biological Foundation of the Fishery of the White Sea Herring," by B. M. Tambortsev.

SSR-Fish. No. 328 - Sardine Eggs and Larvae and Other Fish Larvae, Pacific Coast, 1957, by Elbert Ahlstrom, 104 pp., illus., December 1959.

Annual Report of the Biological Laboratory, Woods Hole, Mass. (for the Year Ending June 30, 1959), Circular 80, 55 pp., illus., processed. This report, constituting part of the annual report of the Branch of Fishery Biology, presents a summary of research activities in the Northwest Atlantic Fishery Investigations program and a description of vessels and shore facil-

ties. As in past years, the research program was directed primarily toward problems associated with the offshore groundfish and sea scallops upon which the New England fishing industry is mainly dependent. The major groundfish species concerned are cod, haddock, ocean perch, whiting, and the species taken by the industrial trawl fishery.

Annual Report of the Fish and Wildlife Service, Bureau of Commercial Fisheries, Bureau of Sport Fisheries and Wildlife, for the Fiscal Year 1959, 46 pp., illus., printed. (Reprinted from the Annual Report of the Secretary of the Interior, for the Fiscal Year Ended June 30, 1959.) Summarizes the various activities of the Service. Describes the activities of the Bureau of Commercial Fisheries; Industrial Research and Services; Columbia River Fisheries Program; Pribilof Islands fur-seal industry; and biological research (shellfish anadromous, inland, and marine fisheries). Bureau of Sport Fisheries and Wildlife activities discussed include Federal aid to the states for the restoration of fish and wildlife, fish hatcheries; fishery management services; and river basin studies.

National Wildlife Refuges in the Northeast (Region 5), 4 pp., illus., February 1960.

Report of the Secretary of the Interior to the President and the Congress on Fresh, Frozen, and Processed Shrimp, 112 pp., processed April 1960. A comprehensive report on the fresh, frozen, and processed shrimp industries prepared for the President and Congress in compliance with Section 9(b) of Public Law 1024, 84th Congress, the Fish and Wildlife Act of 1956 (70 Stat. 1119), enacted August 8, 1956. The investigation upon which this report is based was conducted at the request of national shrimp organization whose members have accounted for over 70 percent of the U. S. production of shrimp. The request was prompted by a growing apprehension in the shrimp industry over its economic future. As important elements contributing to their concern, shrimp producers have cited (1) an increase in the total U. S. supply resulting mainly from high import volumes in 1958 and 1959, (2) a decrease since 1953 in the average annual catches of individual shrimp trawlers, (3) an increase in production costs during the 1950's, (4) record-high cold-storage holdings of shrimp in 1959, and (5) a sharp downturn in prices paid to shrimp fishermen during 1959. The shrimp industry is composed of many segments, such as trawler owners, fishermen, shore-plant operators, processors, shipbuilders and providers, importers, brokers, and distributors. Each group is affected differently by changing conditions in total supply, prices, production costs, and imports. This report is concerned principally with the factors affecting the producing segments of the domestic shrimp industry. Other factors, such as the impact of the present shrimp situation on the consumer, on U. S. trade interests, and on other matters of public interest, have not been considered.

Sep. No. 590 - Exploratory Fishing in Lake Erie, September 1958-November 1959.

Sep. No. 591 - Research in Service Laboratories (June 1960): Contained this article--"Fish Flour is Primarily a Protein Concentrate--Not a Substitute for Grain Flour."

Sep. No. 592 - Equipment Note No. 4 - A Method of Making Electrical Trawl Cable Terminations and Connections.

THE FOLLOWING MARKET NEWS LEAFLETS ARE AVAILABLE FROM THE BRANCH OF MARKET NEWS, BUREAU OF COMMERCIAL FISHERIES, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C.

Number	Title
MNL-17	Italian Fishing Industry, 1959.
MNL-19	Japanese Investments in Overseas Fishery Enterprises.

THE FOLLOWING ENGLISH TRANSLATIONS OF FOREIGN LANGUAGE ARTICLES ARE AVAILABLE ONLY FROM THE U. S. FISH AND WILDLIFE SERVICE, BUREAU OF COMMERCIAL FISHERIES, P. O. BOX 3830, HONOLULU, HAWAII.

Average Year's Fishing Condition of Tuna Long-Line Fisheries, 1958 Edition, edited by Nankai Regional Fisheries Research Laboratory, 44 pp., processed. (Translated from Tokyo Federation of Japan Tuna Fishermen's Co-Operative Associations, 1959, text volume, pp. 1-27.)

Culturing of a Copepoda, SINOCALANUS TENEL-LUS, by Chikayoshi Matsudaira, 6 pp., processed. (Translated from Information Bulletin on Planktology in Japan, no. 5, 1957, pp. 1-6.)

Noise of Creatures in Sea in Region of Ultrasound, by Tomiju Hashimoto and Yoshinobu Maniwa, 15 pp., illus., processed. (Translated from Technical Report of Fishing Boat No. 12, 1958, pp. 99-114.)

On the Gill-Rakers of SARDINIA MELANOSTICTA (Temminck & Schlegel), by Noboru Sako, 2 pp., processed. (Translated from Bulletin of the Japanese Society of Scientific Fisheries, no. 7, 1938, pp. 237-238.)

The Study of Finding the Reasons Why the Bonito Does Not Take to the Angling-Baits, by Yasou Suehiro, 12 pp., processed. (Translated from Journal of the Imperial Fisheries Experimental Station (Tokyo), no. 9, 1938, pp. 87-102.)

THE FOLLOWING ENGLISH TRANSLATION OF A FOREIGN LANGUAGE ARTICLE IS NOT FOR GENERAL DISTRIBUTION BUT IS AVAILABLE FOR REFERENCE ONLY FROM THE U. S. FISH AND WILDLIFE SERVICE, BUREAU OF COMMERCIAL FISHERIES, P. O. BOX 3830, HONOLULU, HAWAII.

Offshore Distribution of Plankton Produced in Coastal Water, by Masataka Kitou, 3 pp., processed. (Translated from Information Bulletin on Planktology in Japan, no. 5, 1957, pp. 7-8.)

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

California Fishery Products Monthly Summary March 1960; 13 pp. (Market News Service U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif.) Calif-

nia cannery receipts of tuna and tunalike fish; mackerel, and anchovies; pack of canned tuna, mackerel; and anchovies; market fish receipts at San Pedro, Santa Monica, and Eureka areas; California imports; canned fish and frozen shrimp prices; ex-vessel prices for cannery fish; American Tuna Boat Association auction sales; for the month indicated.

(Chicago) Monthly Summary of Chicago's Fresh and Frozen Fishery Products Receipts and Wholesale Market Prices, March 1960, 12 pp. (Market News Service, U. S. Fish and Wildlife Service, 565 W. Washington St., Chicago 6, Ill.) Receipts at Chicago by species and by states and provinces for fresh- and salt-water fish and shellfish; and wholesale prices for fresh and frozen fishery products; for the month indicated.

Gulf Monthly Landings, Production, and Shipments of Fishery Products, March 1960, 8 pp. (Market News Service, U. S. Fish and Wildlife Service, 609-611 Federal Bldg., New Orleans 12, La.) Gulf States shrimp, oyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; wholesale prices of fish and shellfish on the New Orleans French Market; sponge sales; and fishery imports at Port Isabel and Brownsville, Tex., from Mexico; for the month indicated.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, April 1960, 4 pp. (Market News Service, U. S. Fish and Wildlife Service, 18 So. King St., Hampton, Va.) Fishery landings and production for the Virginia areas of Hampton Roads, Lower Northern Neck, and Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data; for the month indicated.

New England Fisheries--Annual Summary, 1959, by John J. O'Brien, 51 pp., processed. (Available free from the Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston 10, Mass.) Reviews the fish marketing trends and conditions at the principal New England fishery ports, and highlights of fisheries in other nearby areas. Presents food-fish landings by ports and species; industrial-fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices by months for ports in Massachusetts (Boston, Gloucester, New Bedford, Provincetown, and Woods Hole), Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and monthly landings and ex-vessel prices for fares landed at the Boston Fish Pier and sold through the New England Fish Exchange.

New England Fisheries--Monthly Summary, March, and April 1960, 22 pp. each. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston 10, Mass.) Reviews the principal New England fishery ports, and presents food-fish landings by ports and species; indus-

trial fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, Provincetown, and Woods Hole), Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and landings and ex-vessel prices for fares landed at the Boston Fish Pier and sold through the New England Fish Exchange; for the months indicated.

New York City's Wholesale Fishery Trade--Monthly Summary for January and March 1960, 16 and 22 pp. respectively. (Market News Service, 155 John St., New York 38, N. Y.) Includes summaries and analyses of receipts and prices on Wholesale Fulton Fish Market, imports entered at New York City, primary wholesaler prices for frozen products, and marketing trends; for the months indicated.

(New York) List of Primary Brokers and Importers of Fishery Products and Byproducts, New York City, 1959-1960, 16 pp. (Market News Service, U. S. Fish and Wildlife Service, 155 John St., New York 38, N. Y.)

(Seattle) Washington, Oregon, and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, April 1960, 9 pp. (Market News Service, U. S. Fish and Wildlife Service, Pier 42 South, Seattle 4, Wash.) Includes landings and local receipts, with ex-vessel and wholesale prices in some instances, as reported by Seattle and Astoria, (Ore.) wholesale dealers; also Northwest Pacific halibut landings; and Washington shrimp landings; for the month indicated.

## MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATION OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

### BRAZIL:

Pesca 1958 (Fisheries 1958), 16 pp., processed in Portuguese. Ministerio da Agricultura, Servico de Estatistica da Producao, Rio de Janerio, Brazil, December 1959.

### CALIFORNIA:

California Fish and Game, vol. 46, no. 2, April 1960, 124 pp., illus., printed. Department of Fish and Game, 722 Capitol Ave., Sacramento 14, Calif. Includes, among others, these articles: "Exploratory Longline Fishing for Tunas in the Eastern Tropical Pacific, September 1955 to March 1956," by Kenneth F. Maie and Tom Jow; "Observations on the Growth Rate of the Spiny Lobster," by John Backus; "Age Composition of the Southern California Catch of Pacific Mackerel, Pneumatophorus diego for the

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

**1957-1958 Season," by Harold Hyatt; "Age and Length Composition of the Sardine Catch off the Pacific Coast of the United States and Mexico in 1957-58," by Anita Daugherty and Robert S. Wolf; "Notes on Four Specimens of the Pacific Sardine Taken in August 1957 off British Columbia and Oregon," by Charles F. Reid; and "An Economic Evaluation of California's Sport Fisheries," by John Mahoney.**

**Digest of Commercial Fish Laws, 1959-61, 28 pp., illus., printed. California Department of Fish and Game, 722 Capitol Ave., Sacramento 14, Calif., 1959.** A booklet explaining the California commercial fishing laws. This booklet is not intended to replace the Fish and Game Code but to explain the Code to the fishing industry. It contains information on license provisions, species covered, the commercial fishing districts, provisions of the Code affecting the commercial fisheries, calendar of the seasons, and use or possession of nets in certain districts. Laws governing the catch of fish and shellfish are restrictive; those governing fishing gear are permissive.

**A Field Guide to Some Common Ocean Sport Fishes of California, Pt. I, by Daniel J. Miller, 40 pp., illus., printed. California Department of Fish and Game, Marine Resources Operations, Sacramento, Calif., 1960.**

**CANADA:**  
**The Canadian Fish Culturist, no. 26, March 1960, 34 pp., illus., printed. The Queen's Printer and Controller of Stationery, Ottawa, Canada.** Includes the following articles: "Homing Behavior in Spawning Lake Trout," by N. V. Martin; "Further Observations on the Survival of Yearling Lake Trout Planted in South Bay, Lake Huron," by J. C. Budd and F. E. J. Fry; "Comparative Tagging Returns Employing Three Different Anaesthetics," by R. A. Ryder; "A Possible Source of Error in Assessing the Survival of Pacific Salmon Eggs by Redd Sampling," by J. G. McDonald; and "A Modified Roller Press for Scale Impressions," by M. H. Baker and H. H. Brohm.

**CEYLON:**  
**Administration Report of the Director of Fisheries for 1958, 80 pp., printed in Singhalese and English. Government Publications Bureau, Colombo, Ceylon, February 1960.**

**CONNECTICUT:**  
**A Fishery Survey of the Lakes and Ponds of Connecticut, 395 pp., illus., printed. State Board of Fisheries and Game, Lake and Pond Survey Unit, Hartford, Conn., 1959.**

**CONSERVATION:**  
**The Exploitation and Conservation of the Resources of the Sea: A Study of Contemporary International Law, by Francisco V. Garcia Amador, second and enlarged edition, 226 pp., printed, Fl 26.75 (about US\$7.09). A. W. Sijthoff, Leiden, Netherlands, 1959.** Presents a discussion of the work of the first United Nations Conference on the Law of the Sea held in Ge-

neva in the spring of 1958. The author believes that the recent advances in exploration and exploitation of the riches of the sea and the rise of new national needs and interests necessitate the making of adjustments in traditional international law. The emerging new system must recognize and secure "the legitimate interest of all in the rational utilization of the resources of the sea." The author discusses recent developments with regard to the continental shelf, territorial sea, contiguous zones, and the new baseline technique. He states the view that the plan adopted at Geneva in 1958 properly recognizes the rights and interests of both the coastal states and the nations traditionally fishing on the high seas.

#### CUBA:

**Mar y Pesca, vol. 3, nos. 4, 5, and 6, January-March 1960, 50 pp., illus., printed in Spanish. Departamento de Pesca del I. N. R. A., Nuevo Piso, Plaza Civica, Havana, Cuba.** Includes, among others, these articles: "Industrialización de la Pesca de Agua Dulce" (Commercial Development of the Fresh-Water Fishery), by Federico Gomez de la Maza; "Los Alimentos Marinos en su Aspecto Medicinal" (Seafood and Its Medicinal Potentiality); "Año del Pescado" (Seafood Year); "Adelantos Pesqueros en Jamaica" (Progress in Jamaica's Fisheries); "Probabilidad Comercial de la Sardina en Cuba" (Commercial Possibilities of the Cuban Sardine), by Armando Perez Gattini; "Cooperativas de Pescadores" (Fisherman's Cooperatives); "Visitando los Fondos de los Abismos Marinos" (Exploring the Depths of the Oceans); and "La Industria de la Pesca en Rusia" (The Russian Fishery Industry), by Fidel de Varona C.

#### DIRECTORIES:

**Amendments to a Directory of White Fish Exporters in the United Kingdom, 4 pp., printed. White Fish Authority, Lincoln's Inn Chambers, 2-3 Cursitor St., London EC4, England.**

#### ECHO-SOUNDING DEVICES:

**"Fishing with Sound," by Yu. A. Shemanskiy, article, Priroda, no. 2, pp. 104-105, printed in Russian. Priroda, Akademiya Nauk SSSR, M. Khariton'yevski per. 4, Moscow, U.S.S.R., 1958.**

#### EELS:

**"The Atlantic Eel Problem," by C. L. Deelder and Denys W. Tucker, article, Nature, vol. 185, no. 4713, February 27, 1960, pp. 589-592, printed. Nature, MacMillan & Co., Ltd., St. Martin's St., London WC2, England.**

#### ELECTRICAL FISHING:

**The Development and Evaluation of Interrupted Direct Current Electro-Fishing Equipment, by Max Dean Rollefson, Cooperative Research Project No. 1, 123 pp., illus., processed. Colorado Cooperative Fisheries Research Unit, 243 Forestry Bldg., Colorado State University, Fort Collins, Colo., May 1958.** This project was conducted jointly by the Colorado

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State University, Wyoming Game and Fish Commission, and Colorado Game and Fish Department. Quantitative evidence of electrofishing success under field conditions with direct current, alternating current, and pulsed direct current was compared. In addition, electrocution experiments were performed to ascertain the approximate minimum lethal exposure periods of carp to electric fields of several conditions of alternating current voltage and current density.

"A Direct-Current Electrofishing Apparatus Using Separate Excitation," by A. R. Murray, article, The Canadian Fish Culturist, no. 23, pp. 27-32, printed. The Canadian Fish Culturist, Department of Fisheries, Ottawa, Canada, 1958.

#### EUROPEAN ECONOMIC COOPERATION:

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55	Closed Season on Frogs Ended, but One on Several	76	Antarctic Whaling Fleets Return After Good Season
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55	Closed Season on Sponges Announced	77	Lithuanians Fish Newfoundland Banks
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55	Rainbow Trout Producers Association Dissolves		FEDERAL ACTIONS:
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55	Licenses	78	Crab Fishermen's Association Denies Charges of Unfair
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56	Foreign Vessels Permitted to Fish for Bait in		pressing Competition
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57	Shrimp Fishery Trends, First Quarter 1960	78	Proposed Addition to List of Spices, Seasonings, etc.,
	French West Africa:		Recognized as Safe
57	Conference Discusses Future of Sengalese Tuna Fishing		Department of the Interior:
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59	Gabon Republic:	80	Bureau of Commercial Fisheries:
59	Whaling Industry Revived in 1959	80	Quality Standards Established for Frozen Salmon Steaks
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59	Research Vessel Replaced by Trawler-Type Vessel	82	Headless Shrimp
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## CANNED SHRIMP FOR QUICK MEALS

Although the shrimp fishery extends all the way from North Carolina to Texas on the Atlantic and Gulf coasts and from California to Alaska on the Pacific coast, canning operations are concentrated principally in the colorful bayou country of the Alabama, Mississippi, Louisiana, and Texas coasts in such picturesquely named cities as Bayou La Batre, Biloxi, Dulac, Chauvin, Golden Meadow, Houma, and Westwego. The North Pacific cannning operation is relatively new but is bringing to the American housewife the delectable and dainty cocktail shrimp.

Canned shrimp are available in  $4\frac{1}{2}$ -, 5-, and 7-ounce cans, either packed in brine or dry. They are easy to store and require little or no preparation, a real convenience in these hot weather days. All that is required is to remove the shrimp from the can, wash in cold water, and proceed with the recipe.

The home economists of the U. S. Bureau of Commercial Fisheries, suggest the following recipes:

### SHRIMP THERMIDOR

2 cans ( $4\frac{1}{2}$ or 5-oz. each) deveined shrimp	$\frac{1}{2}$ teaspoon powdered mustard
1 can (4-oz.) sliced mushrooms, drained	Dash cayenne pepper
$\frac{1}{4}$ cup butter or margarine, melted	2 cups milk
$\frac{1}{4}$ cup flour	Grated Parmesan cheese
Paprika	

Drain shrimp. Rinse in cold water. Drain. Cut large shrimp in half. Fry mushrooms in butter for 5 minutes. Blend in flour and seasonings. Add milk gradually and cook until thick, stirring constantly. Stir in shrimp. Place shrimp mixture in 6 individual, well-greased shells or 6-ounce custard cups. Sprinkle with cheese and paprika. Bake in a hot oven,  $400^{\circ}$  F., for 10 minutes or until cheese browns. Serves 6.

### SHRIMP FONDUE

2 cans ( $4\frac{1}{2}$ or 5-oz. each) deveined shrimp	3 eggs
8 slices white bread	$\frac{1}{4}$ teaspoon powdered mustard
2 tablespoons butter or margarine	Dash pepper
3 tablespoons chopped green pepper	2 cups milk
1 cup grated cheese	Paprika

Drain shrimp. Rinse in cold water. Drain. Cut large shrimp in half. Remove crusts from bread and butter bread. Place 4 slices in a well-greased baking pan, 8 x 8 x 2 inches. Cover with layer of shrimp, green pepper, and half of the cheese. Top with remaining slices of buttered bread and cheese. Combine eggs, mustard, and pepper; beat with a rotary egg beater. Add milk; pour over sandwiches. Sprinkle with paprika. Bake in a slow oven,  $325^{\circ}$  F., for approximately one hour or until fondue is firm in the center. Serves 6.

